AMERICAN ANTIQUITY

VOL. III APRIL, 1938 No. 4

EDITORIALS

AMATEUR CONTRIBUTIONS . . . From the hour of its inception, it has been the policy of this journal to serve the needs of students in the field of American archaeology, whether their status be that of general students or specialists, professionals or amateurs. With this purpose prominently present at the front of its collective mind, the Editorial Staff has sought to include in copy for each issue, in so far as possible, matter of sufficient variety to interest the variety of students represented in the Society. The extent of its success or failure is best known to the readers.

Since it was conceded that many of the interests of the more general students could best be served by articles prepared by such students themselves, and since it was foreseen that few among this large and important element of our readers would contribute major articles, your editor announced that the "Correspondence" division was open for short articles submitted by non-specialist, non-professional students. There appeared to be an immediate, enthusiastic response to this invitation.

However, it now appears that the professionals and other specialists are threatening to take over the "Correspondence" division and make it their own. After all, your editor can only publish matter that is submitted to him. If contributions suitable for this division come preponderantly from the specialists, the editor is helpless to maintain a balance favorable to the general student.

The problem is in your hands, fellow students, rather than in the willing but impotent ones of your editor, who wonders how the challenge will be met. Please remember this angle to the problem when you are tempted to be adversely critical of the subject matter in the journal in relation to your interests.

NEWS ITEMS . . . We hope that you have noticed the "Notes and News" division of the journal. In its pages there is always room for items covering local meetings and other gatherings of archaeological import. Send us the news and we will publish it.

OBSERVATIONS ON THE PRESENT STATUS AND PROBLEMS OF MIDDLE AMERICAN ARCHAEOLOGY,

PART II[233]

J. ALDEN MASON[234]

MIDDLE American archaeological research has always been especially centered in the Maya[235] region of Guatemala and Yucatan, for here, apparently, ancient American civilizations reached their culmination in art, architecture, writing, and probably in mathematics and astronomy. There are more specialists who limit their researches to one field in the Maya area than in any other branch of American archaeology, and among these are many whose sole interest is in the topics of epigraphy and the calendar. This field is highly specialized and requires experts, but the great value of their results is not *per se*, but lies in the accurate dating which can be given to developmental phases of architecture, ceramics, and similar products; once the temporal relationships of these are established, they may be used as a time-scale for adjacent regions to which these objects and traits were carried by influence and trade.

The size and architectural wealth of the Maya cities permit large and long-term expeditions comparable to those in the Near East and unequalled elsewhere in America. The Carnegie Institution of Washington worked at the "New Empire" site of Chichen Itza in Yucatan for thirteen years, at the "Old Empire" site of Uaxactun in Guatemala for twelve years, and at Copan for the past three years. The University Museum has completed its seventh season of work at Piedras Negras, another early Maya city in Guatemala. These extensive careful excavations have resulted in a great increase in our knowledge of Maya architectural development in the last decade. Nevertheless, hardly more than a beginning has been made. More than eight hundred Maya sites are known, of which none has been entirely excavated. Modern careful scientific work has been done on probably no more than twenty of these sites, and at hardly more than the four named above can major excavations be said to have been done.

---

[233] Part I appeared in the preceding (January) number.

[234] University Museum, University of Pennsylvania, Philadelphia.

[235] For many valuable suggestions in this section I am much indebted to my associate, Linton Satterthwaite, Jr. See Tozzer, 1934, for a much fuller account of the status and problems of Maya research.

Steady but slow progress is being made in deciphering the Maya glyphs. The majority of those known today, giving the main elements of the calendrical system, were deciphered thirty years or more ago, and since that time relatively few have been interpreted; these deal mainly with the Supplementary Series, which refers to the phases of the moon and a lunar calendar.

The study of glyph styles and evolution, and of local and temporal peculiarities and variants of known glyphs, of which Beyer[236] is the protagonist, is one which has great potentialities for chronological tie-ups and checks, and for the delimitation of geographical groupings.

Practically all the glyphs that can be read refer to calendrical, mathematical, and astronomical calculations, but there remain a large number which have not been deciphered. While this residue may amount to half the total number of glyphs, they occur less frequently and in less regular position. Regarding these, savants disagree. In the early stages of the study of Maya epigraphy so many ill-conceived and fruitless attempts were made to read the glyphs as alphabetic, syllabic, or phonetic that some of the older students look upon any researches in this line as reactionary, and believe that nearly all the glyphs are ideographic and non-phonetic and refer exclusively to calendrical matters. An example of this is Schellhas' brief comment[237] when he mentions Whorf's[238] new attempt and passes it off with the remark: "I suppose it will be the last." These undeciphered glyphs are generally found in small groups, without numerical coefficients and under circumstances that suggest names or short descriptions. Whorf has not published enough yet to give conviction to his results, but what he has presented seems to me sound and promising. His work offers a new approach to the problem through the field of comparative linguistics rather than that of known epigraphy, and as such I look for most valuable results from it.

One of the most important problems of Maya research is that of the correlation of the Mayan and Gregorian calendars. Each is an accurate system, distinguishing each day from every other one, though the later Mayas, unfortunately, allowed the "Long Count" of earlier days to be practically abandoned, and distinguished days, as did the highland Mexicans, only within the 52-year period. This, among other things, has prevented the correlation of the two calendars with certainty[239] which

[236] Beyer, 1932.
[237] Schellhas, 1936.
[238] Whorf, 1933, 1935.
[239] Thompson, 1937.

must be done before we can have any clear picture of Maya history, and be able to correlate events in extra-Maya regions. Ten years ago the Morley-Spinden correlation was almost universally accepted in this country. In the last decade or so quite a number of articles upon this important subject have been published, and at present, despite the German astronomer Ludendorff's[240] many articles apparently verifying Spinden's dates by astronomical calculations, few American specialists still hold to the older correlation; all the others, even including Morley, have been won over to the Goodman-Thompson-Teeple-Martinez correlation, which is roughly 260 years later. There are minor variants of all of these correlations, and not one agrees with all the data; in each one some inconsistency or contradiction must be "explained away." It is most unlikely that any correlation will ever be advanced that will satisfy all the evidence; probably some of the statements of the historians of the time of the Spanish Conquest were in error, or possibly the calendar was rectified at some unknown time. The Goodman-Thompson correlation seems to present the fewest difficulties. This problem must be left mainly to epigraphers, but whatever correlation is proposed must meet and satisfy the evidence of excavations, of ceramic and architectural development. Vaillant[241] feels that even the Goodman-Thompson correlation does not do this and that a correlation later by several centuries, placing the Maya Great Period in the eleventh or twelfth century instead of the eighth proposed by Thompson, or the sixth of the Spinden correlation, would fit his ceramic evidence better. Thompson has answered some of Vaillant's objections in the latest article upon the problem,[242] and my personal impression is that the ceramic and other archaeological evidence will eventually be found to fit the frame of the Goodman-Thompson school; the former must be the final arbiter, however.

The origin of the Maya high culture is a most important problem which has hardly passed the theoretical stage. No very early consistently Mayan site of such long continued occupancy as the Archaic sites studied by Vaillant in the Valley of Mexico has yet been found. The status of this question is about the same today as was the sequential problem in the Valley of Mexico before Vaillant began his work, and it is probable that equally intensive excavations in the Guatemala

[240] Ludendorff, 1930–1937.

[241] Vaillant, 1935. Important tables are here given as well as a very full bibliography upon the correlation question.

[242] Thompson, 1935. The latest word, with a full bibliography.

highlands will reveal as large a number of cultural phases. Gamio[243] made some stratigraphical excavations in 1925, and recently the Carnegie Institution has begun investigations near Guatemala City.

The Maya city of oldest, and also longest, proved occupancy, on the basis of the dated monuments, is that of Uaxactun in the Peten district of Guatemala. Here the Carnegie Institution has just ceased excavations after twelve years of intensive investigations. The monuments prove an occupation period of at least 561 years, from the Mayan date 8.14.10.13.15 or 328 A.D. in the Goodman-Thompson correlation. As the earliest dated monument is associated by architectural evidence with Pottery Period II, it is evident that the first occupation of Uaxactun must have been not later than the third century. Despite this earliest date Ricketson[244] states that there is no evidence that the site was ever occupied by a pre-Mayan people; all the skeletal and archaeological remains found he believes to be of demonstrably Mayan type. Moreover, the traditional history of the Maya as recorded in the books of Chilam Balam state that the Maya were the first occupants of this region. This we may doubt, for it is almost impossible that the jungle was not ranged at least by nomadic hunting tribes, and possibly sparsely occupied by peoples of manioc culture like some South American groups, who left little trace of their occupancy. More recent stratigraphical work at Uaxactun indicates that Ricketson's opinion in this question may have to be changed; Smith[245] apparently prefers to split Mrs. Ricketson's[246] Period I into several sub-periods, the earliest of which, the Mamon, lacks polychrome pottery and vessels with feet, and contains figurines of a type with much superficial resemblance to Archaic forms of the Valley of Mexico. Whether these are to be considered Proto-Maya or Pre-Maya is still a question of personal opinion. There are some tenuous evidences of the influence of the Q-Complex in this early period at Uaxactun, but it seems to be weak here and not yet found at other old Maya sites except at Holmul where, in the earliest period, it is rather strong. This is leading Maya students to revise their opinions, based on the early Holmul sequences,[247] that the Q-Complex underlay and gave rise to typically Mayan artifacts rather uniformly throughout the lowland Maya region; it is now believed that the earliest

[243] Gamio, 1926–1927.
[244] Ricketson, 1937.
[245] Smith, 1936.
[246] Ricketson, 1937.
[247] Merwin, and Vaillant, 1932.

phases of Holmul were unusual and came under specially exotic influences, and that the Q-Complex influence may have been generally weak in the lowland area.

These recent changes in opinion, rendering obsolescent hypotheses barely off the press, illustrate the state of flux of opinions regarding Mayan origins and early phases. There are few fields of American archaeology in which work of a careful stratigraphical and sequential nature is more needed. The work of the Carnegie Institution is noteworthy and worthy of emulation in this respect, as is that of the University Museum at Piedras Negras; the latter site, being apparently not so old, presumably will not afford such valuable data on the earliest phases.

One of the most surprising results of the Uaxactun excavations was the discovery that metates and manos are not found in the early periods. Ricketson[248] prefers the hypothesis that at that time wooden mortars or other implements were used. In view of the almost universal association of metates with maize culture in Middle America, even in the earliest periods, this theory fails to carry conviction. An alternative hypothesis, that the Maya were non-agricultural at the time of their settlement at Uaxactun, he properly rejects as untenable. There is still the possibility of manioc culture. That the early Maya were of this culture is also unlikely; whether the earliest Uaxactun phases can be ascribed to a non-Mayan manioc-growing people is a possibility that only future researches can determine.

Although it takes us back to an even earlier horizon, it is now believed that maize was developed in the Guatemalan highlands rather than in Mexico or further south.[249] A number of sites in the highlands have now been excavated, mainly by the Carnegie Institution, and these have produced artifacts of quite varied types, presumably of different horizons and ethnic groups, and in varied proportions at each site. In some, apparently among the oldest, the influence of the Q-Complex is very strong or almost paramount.

The Q-Complex is a concept evolved several years ago, mainly by Vaillant[250] and Lothrop,[251] to denominate a complex of elements which is found, in greater or less proportion but seldom if ever dominant, in many regions from Peru and Venezuela to the Caddoan mounds of

[248] Ricketson, 1937, p. 291.
[249] Kempton and Popenoe, 1937.
[250] Vaillant, 1932, 1934.
[251] Lothrop, 1933, 1936.

Arkansas. It consists of about a dozen specific pottery forms and techniques of which a majority are generally found associated in any given site, but never the total. It is not found in the Archaic of the Valley of Mexico except for some tenuous influences in the Zacatenco II period, though it probably flourished further to the south on the same horizon. It is evidently a very old and fundamental, if not the oldest "culture" in Central America and probably came from the south, possibly from parts of Colombia where it is very strong. The fact that the full quota of elements is nowhere found suggests that it is in itself a combination of several influences, the elements possibly arising from several different sources and upon different horizons. It is a surmise of mine that it may be a combination of a stream of Amazonian elements via Venezuela and one of highland elements via western Colombia.

The assumption must be guarded against, though, that wherever found, Q-Complex elements betoken an ancient horizon; in some places they evidently persisted until Conquest days, though probably in less strength and purity. Whether this complex spread by slow contacts from a single source, or from many sources, or whether it was the property of a migrating group will form a fundamental study of the greatest importance, a prerequisite for which must be a study of the distribution of the Complex and of its component elements.[252]

In highland Guatemala the Q-Complex influence was strong in early days and in certain places; it and other local old elements were apparently submerged and assimilated by the Maya as they were in other regions by other historic cultures. Its influence in the lowland Maya region was not great, suggesting that, at the time of the Maya settlement in the lowlands, it had already become submerged. In one place in the Guatemalan highlands the Mayan remains are separated from the non-Maya and pre-Maya by several yards of sterile volcanic ash, but the chronological separation was probably not great.[253]

It was formerly one of the favorite theories that the Maya came to their present habitat from the north; the facts that the Huaxtec speak a Mayan language, that the Totonac language may also be related, and that the object with the oldest known Maya date, a portable figure, was found to the north of the present Maya region were advanced in support of this hypothesis. Few modern Mayologists give this theory cre-

[252] Without any intent of "staking a claim," I hope to prepare such distribution maps for the Conclusions to my reports on Santa Marta, Colombia, in which region the Q-elements are very strong if not dominant.

[253] Lothrop, 1933, p. 59.

dence; they are now inclined to look southward. Though the higher aspects of the culture were almost certainly developed in the present habitat, and probably in the highlands rather than the lowlands, it is not impossible that the earliest Maya were South American in physical type,[253a] language, and basic primitive culture. A relationship of the language with Carib-Arawak has been suggested,[254] but the uncritical presentation has never been properly evaluated. The material culture of the most primitive group of living Maya, the Lacandon, certainly has, superficially, a very South American aspect. Some of the tribes of lower culture who adjoined the Maya on the south were fundamentally of South American culture and language, a fact of the greatest importance in problems of Middle American archaeology. If the Maya themselves did not originally belong to the same culture, at least they must have received and transmitted northward many South American cultural elements, and it is not unlikely that the earliest Maya to enter the Peten forests and the Yucatan plain, possibly having developed the elements of their higher civilization in the Guatemalan highlands, found the region sparsely populated by semi-sedentary peoples of manioc culture and South American affinities.

The fact that both the Maya and the Taino or Insular Arawak of the Greater Antilles played a ceremonial game in a special enclosure with a rubber ball, which might not be thrown or kicked, is a close resemblance that is rendered more intriguing by the fact that the playing field was called *batey* by the Taino; the ring-goal, *bate* by the highland Maya Quiche.[255] The latter resemblance may be fortuitous or due to post-Columbian transfer; the former may be a very old cultural element of South American origin, which, with variations in detail, may have been common to both the Insular Arawak and to the tribes of basically South American culture who adjoined the Maya on the south, or to the Maya themselves. A very similar game is reported from Guiana or Venezuela at the time of the Conquest.[256] The use of the ring-goal was apparently not known in the Antilles or South America.

[253a] " . . . the type . . . of the coastal Cunas (of Panama) is evidently very close on one hand to that of the Mayas of Yucatan, and on the other to that of the Yungas who extended for a great distance along the west coast of South America, to below Nazca." . . . "In general this type appears to be close to that of the Mayas of Yucatan, so close as to constitute a strong suggestion of original identity of the two groups." (Hrdlička, 1926.)

[254] Schuller, 1919–1920.

[255] Blom, 1932.

[256] Gumilla, quoted by Roth, 1924, p. 488.

Thompson[257] has already suggested the South American origin, but believes that the introduction into Middle America was "fairly late." Lothrop[258] agrees with Nordenskiöld that it was of great antiquity.

Until within the last fifteen years, the life of the Maya of the early period was as little known as that of the Toltecs. Of their development we knew nothing. Their cities were presumed to be composed almost exclusively of single-room "temples" on pyramids and multi-roomed "palaces" on low platforms. The period of occupancy of a city was determined by the time between the first and last sculptured dates. Little more than this could be determined by surface clearing of the latest important superficial structures; it required several seasons of work at the same site, such as those of the Carnegie Institution at Uaxactun and of the University Museum at Piedras Negras, with excavations of the buried substructures, to modify and augment these opinions. Owing to the Maya practice of burying older structures under new accretions, the earlier ones can sometimes be uncovered in an excellent state of preservation, and the architectural development thus traced. Ceramic types encountered in the various levels can often be correlated with the architectural type, and these with sculpture and calendrical dates. Finally, the sequences established at one site can be compared with those at another. The dated monuments are now less highly regarded as criteria, since it becomes evident that certain ones were moved from their original positions, and that the occupation of the cities generally preceded the earliest date. At Piedras Negras there may have been a period of plain or painted stelae. At this site the present picture of the earliest community is one of buildings all on low platforms; some of the walls were of wattle-and-clay, others of masonry, probably with peaked thatch roofs, or with flat roofs and ceilings of beam and concrete. The characteristic Maya masonry vault seems to be here a relatively late introduction, probably from the Peten region; some of the non-vaulted structures with roofs of perishable materials seem to have survived, or even been built, at a much later time. Architectural and ceramic characteristics have been established for several cities and regions; the cities of the Peten region seem on the whole to be older than those of the Usumacinta, and had considerable architectural influence on the latter.

The excavations at Piedras Negras indicate that the "palaces" were not used for domiciliary purposes. Structures of another functional

[257] Thompson, 1936, pp. 16, 17.
[258] Lothrop, 1937, p. 27.

type, almost certainly sweat-baths,[259] have been identified at Piedras Negras, as well as at Chichen Itza, and will probably be discovered at other cities, and new forms of temples and palaces have been found. It is likely that other types of edifices will be identified.

An interesting study by Satterthwaite[260] at Piedras Negras, of great possibilities, concerns the index of the relative thickness of walls and the width of vaulted rooms. He found that on the whole, in structures of similar design, this index could be correlated with the chronological architectural development of palaces, the probably earlier vaulted structures tending to have thicker walls or narrower rooms, or both, an expected development resulting from increased experience in vault-building. It seems valuable, however, only as one of several criteria, and may easily give misleading results if used blindly. Furthermore, there are marked variations in these respects among non-vaulted buildings, for which a technological explanation seems to be lacking. At present the only safe application of the method to large bodies of miscellaneous material is a negative one. If a given vaulted building is not massive, it seems necessary to postulate a prior period of development somewhere in the Maya area.

With these larger and more intensive excavations Mayologists are coming to modify their preoccupation exclusively with the major structures, and are paying some attention to the quantities of house-mounds that surround the ceremonial centers.[261] This should afford more information on the economic and every-day life of the populations.

It was formerly believed that one by one the great cities of the south were abandoned for some undetermined economic reason, and that the populations, after wandering for several centuries, finally "discovered" northern Yucatan where they established a new and more glorious civilization. The cause for the abandonment of the older cities is still a disputed question; impoverishment and denudation of the soil is the reason most generally accepted. Destruction of the cities by war, either by inter-city conquest or internal revolt, has, curiously enough, hardly been considered,[262] although this was the immediate cause of the abandonment of the later Maya cities, and the usual reason for the decay of Old World empires. The pacific nature of the early Maya has almost certainly been overstressed. A number of the sculptures at Piedras

[259] Satterthwaite, 1936; Cresson, 1938.
[260] Unpublished.
[261] Wauchope, 1934.
[262] But see Thompson, 1931.

Negras obviously portray martial scenes. The evidence indicates that this city, as a flourishing religious center, met a violent end. All the human faces of the monuments are mutilated, though the latter may be otherwise undamaged. The thrones in the rooms of three palaces were obviously intentionally destroyed, as their parts were widely scattered, and some missing, whereas if they had been destroyed by natural collapse of the building the parts would have been all found together; the rest of the debris was left *in situ*, indicating that the structures were not afterwards used. These buildings were of the last period and evidently in use at the end of intensive occupation. Possibly equally careful work in other sites would reveal similar conditions.

There is also some indication that, in some of the cities at least, the occupation continued for a short period after masonry construction and the erection of dated monuments ceased, probably overlapping the foundation of the earliest Yucatan cities where a few very early dates have been found. Possibly instead of a mass migration, the leadership in civilization merely passed from the Guatemalan to the Yucatecan Maya.

Among the most pressing problems of Maya archaeology are the determination and more precise delimitation of sub-areas, identifiable by ceramic and architectural peculiarities, the interrelations of these sub-areas and their relations with Mexico and the south. The origin, history, and distribution, in time and space, of many architectural elements, such as vaulted ceilings, roof-combs, masonry piers, beam-supported flat concrete ceilings, and many other minor features, need to be determined. Above all, we need to know how a Maya city functioned.

The southern boundary of the Maya culture is a question that has not yet been satisfactorily answered, and few explorations with this in view have been made. Strange to say, the higher manifestations and intensive area seem practically to end with one of the most magnificent old cities, Copan in northern Honduras; no sites of any importance seem to exist southeast of here, and pure Maya remains have been found but a short way beyond. There was a high culture in the Uloa Valley[263] which shows strong Maya influence but is not pure Maya. The same may be said of Salvador[264] on the Pacific Coast; objects, especially pottery, from here bear a close resemblance to those from

[263] Popenoe, 1934.
[264] Lothrop, 1927.

the Uloa and seem to mark a transition between Maya and the cultures of Nicaragua and Costa Rica. The southernmost "Maya city" so far reported is that of Los Naranjos[265] on the shores of Lake Yojoa, Honduras.

In the major part of Central America, Honduras south of the Maya region,[266] Nicaragua, Costa Rica, and western Panama, little modern careful stratigraphical work has ever been done, though very large collections exist in many museums, especially from the Chiriqui region of Panama and from Costa Rica. On the basis of these Lothrop[267] was able to distinguish many different types of pottery, and to draw valuable deductions regarding cultural relations, influences and sequences, most of which are cogent, logical and acceptable as hypotheses, but must be verified by scientific excavations. Naturally in this region the mutual inter-influences from North and South America become strongest. The distribution of linguistic groups indicates that profound changes in habitat and distant migrations must have occurred. Small groups of peoples of Nahua affinities, closely related to Aztec, and probably of Toltec origin, are found in western Panama and western Nicaragua, giving this language a distribution, though scattered, from Sinaloa to Panama.[268] These southern groups are few, small and widely separated, and probably remnants of small colonies established not long before the Spanish Conquest. Archaeologically they are unimportant. The larger areas in southern Mexico, reaching nearly to the Guatemalan borders, were probably settled earlier. These facts must be taken into consideration in investigating the archaeology of these areas. Thus, between the present Totonac region and the Pacific Coast of Guatemala, regions showing close archaeological resemblances, a large area of Nahuan and Zoquean languages intervenes. The Pacific Guatemalan culture is generally ascribed to the Pipil, a group of Aztec, or probably Toltec linguistic affinities.

The Chiapanecan peoples are found in four small isolated groups from Chiapas in Mexico to northwestern Costa Rica; these are an important people archaeologically, the widespread "Chorotegan" culture being ascribed to them. Their present—or recent—habitat suggests that they are remnants of a once widespread continuous population, and this is to some extent borne out by the archaeological evidence.

[265] Stone, 1934; Yde, 1936.
[266] Strong, 1935.
[267] Lothrop, 1926.
[268] Thomas and Swanton, 1911.

Their culture was apparently one of the oldest, and underlies the Maya along the southern border of the latter region; in early Maya ceramics there seems to be considerable Chorotegan influence.

From a linguistic, ethnological, and largely from an archaeological point of view, much of southern Central America is South rather than North American, especially in the lowlands and foothills of the Atlantic drainage, including those of Nicaragua and Honduras. Most of the tribes of this region are extinct or on the verge of extinction, have lost their languages, and are deculturized. Comparatively little is known of their former cultures, but authorities agree that the Jicaque peoples who, apparently, adjoined the Maya on the Atlantic Coast of Honduras, were fundamentally South American in culture; Thomas and Swanton[269] would include in the latter culture group the Xincan of southern Guatemala who were in contact with both the Mayan Pokomam and the Nahuatlan Pipil, as well as the Lencan of central Honduras whose boundary was close to Copan, and several other important peoples of highland Honduras and Nicaragua. The speech of the Ulvan peoples of eastern Nicaragua and southern Honduras was probably related to that of the Chibcha nation of the region of Bogota in highland Colombia. These peoples of the Atlantic Coast left few archaeological traces of their occupancy. Possibly the more highly cultured of them in the highland region were the bearers of the elements of the Q-Complex.

The archaeological cultures of Panama were[270] almost exclusively South American in nature; those of eastern Costa Rica, mainly so. The Pacific Coast of Nicaragua and Costa Rica on the other hand was almost purely North American. In Costa Rica we find Mexican, Mayan, and South American elements, the South American traits including both those from the highland region and Carib-Arawak elements from the eastern lowland area. The meeting place of the continents is, therefore, in the highland region of Costa Rica, but there is no clear line of division, many of the pottery types of this region showing a fusion of elements from both north and south. Further to the north, at the Isthmus of Tehuantepec, the cultural stream crosses to the Atlantic Coast, and the archaeological relationships of the Pacific highlands of Central America are with the Totonac and Huaxtec region of the coast of the Gulf of Mexico.

These general observations merely serve to point out the scope and

[269] Thomas and Swanton, 1911.
[270] Osgood, 1935.

field of archaeological problems in the Central American area. At the present stage they are general rather than specific.

That considerable trade in artifacts from distant regions also obtained in pre-Columbian days is well proved by frequent finds. Many of the gold objects dredged up from the sacred cenote at Chichen Itza are obviously of Isthmian if not of Colombian origin, and Maya trade objects have been found in the Chiriqui region. Also Lothrop[271] records the recent discovery at Zacualpa, in the Guatemalan highlands, of a gold plaque, which he identifies as a product of northern Peru, probably of the ninth or tenth century. Such trade pieces, of course, are most important aids in the determination of the correlative chronologies in different regions, especially for South America where no dated monuments occur.

So little known is Central America in general that future discoveries may reveal archaeological cultures at present entirely or but slightly known. Such a discovery was made only a few years ago in the department of Coclé, Panama,[272] where the Peabody Museum of Harvard University recently completed excavations that revealed remarkable objects of a new culture phase, including polychrome pottery of which only a few pieces had until then been known as exotic or trade pieces in collections from Chiriqui.

Although the Antilles or West Indian Islands are generally considered geographically with Central America, they belong ethnologically and archaeologically with South America and their problems are tied up with the latter area. Yet the geographical distances separating Florida from Cuba and the Bahama Islands, and Cuba from Yucatan are so slight that the presumption of contact is very great. The vision of Mexican influences reaching Florida via Yucatan and Cuba has been seen by more than one archaeologist. That there were many contacts between the Bahamas and Florida is generally granted, and about the time of Columbus a small Arawak colony from the West Indies had been established in Florida.

There are said to be historical records of pre-Columbian trade between Cuba and Yucatan,[273] but if so they left absolutely no archaeological record, had apparently no influence on native culture, and must have been at a very late period.

The archaeological resemblances between the Antilles and the

[271] Lothrop, 1936.
[272] Lothrop, 1937.
[273] Gower, 1927.

Southeastern United States are characterized by Dr. Gower[274] as being too great to be purely fortuitous and yet not sufficiently great to justify belief in any actual migration from the islands; they are best accounted for by the assumption of a common primitive culture and a "series of not extremely intimate contacts occurring at intervals during a long period of time."

The status of the earliest populations of the Antilles is one that is still in a nebulous state and requires more study, excavations, and correlation of data.[275] At the time of the Conquest the Arawak, who had formerly populated all the islands, had been submerged by the conquering Carib in the Lesser Antilles, but the latter had not yet reached Cuba. It was formerly believed that the Arawak were the first inhabitants of these islands and that their remains and sites could be identified by unpainted pottery; painted pottery was ascribed to the later Carib. This easy-going assumption was upset by Harrington's[276] discovery of the more primitive and earlier Ciboney culture in Cuba; these people had several characteristic implements, worked flint as the typical Tainan did not, did not flatten their heads, and probably were ignorant of pottery. The fact that their remains have not been definitely identified from Puerto Rico and the Lesser Antilles suggests that they may have come from Florida, but the possibility that they preceded the Arawak and Carib up the island chain from Venezuela is still open to the proof of future excavations in the southeastern islands.

That stratigraphical excavations in these islands of dense population, intensive agriculture, and the longest history of superficial archaeological collecting in America may still result in revolutionary discoveries is indicated by the recent, very important work of Rainey and Rouse, which opens entirely new vistas. A non-pottery and probably pre-pottery culture is still apparently unknown in the Lesser Antilles, but in northern Haiti sites were found with quantities of large rudely flaked and chipped flint scrapers, knives and spearheads, but without pottery. Smoothed but not polished stone implements, especially well-shaped thick discoidal or oval hand-stones, some with grooved circumferences, are typical, and red ocher was found throughout.[277] Similar flints have been found in Santo Domingo,[278] but apparent-

[274] Gower, 1927.
[275] Loven, 1935.
[276] Harrington, 1921.
[277] Rainey, 1936.
[278] Hatt, 1932.

ly no traces of any non-pottery flint culture have yet been found in Puerto Rico and the Lesser Antilles. The general aspect of the Haitian material is Southeastern United States rather than South American, but Rainey and Rouse do not suggest any relationship with the Ciboney. Excavations in shell-heaps in the Bahama Islands, the presumable route from Florida, might result in important light on this problem. Bahaman archaeology is almost absolutely unknown; the report is that little is to be found there, but probably, as in the Greater Antilles until recently, no stratigraphical work in shell-heaps has ever been attempted.

In other sites in Haiti, of later period and lacking flint objects, a type of pottery very different from the typical later Arawak was found, a thin gray with decorations of fine lines in hatching and cross-hatching. This has, megascopically, a very close resemblance to some types of ware from Colombia and Venezuela. Rainey terms this the "Carrier" type and considers it rather late and of Arawak affinities, though stratigraphical proof is lacking.

Even more puzzling problems were opened by the discovery of the "Crab Culture" in Puerto Rico by Rainey[279] and Rouse. Excavating in shell-heaps in several different places in the island, at a depth of several feet and beneath the typical Arawak deposits of unpainted pottery and molluscan remains, Rainey found deposits of a people who obviously lived primarily on crabs and made polychrome pottery of a high type with prominent designs in red and white on brown. The cultural and ethnological connections of this people are still a puzzle, though Rouse[280] now believes that the "Crab" and the typical later Arawak "Shell" cultures were but phases of a single cultural development that took place in Puerto Rico, with intermediate stages. The polychrome pottery certainly has a very exotic appearance for the Antilles, and seems to have closer resemblances to Lower Amazon pottery. Similar pottery has been found in the Virgin Islands and the Lesser Antilles, but not in Haiti, so the influence probably came from South America. A few non-pottery sites were also found, presumably earlier, but without definite connections either with the flint-bearing sites of Haiti or the Ciboney of Cuba. Though many large archaeological collections exist from the Antilles,[281] the careful excavation that has been done there is still so slight that the entire question of ethnic relationships is in a preliminary stage, and it is to be hoped that work of the type of that done by Rainey and Rouse will be continued.

[279] Rainey, 1935; Mason, 1935–1937, I, 162; II, 227, 228.

[280] Rouse, 1937.

[281] Fewkes, 1907, 1922.

REFERENCES CITED[282]

BEYER, HERMANN
1932. The Stylistic History of the Maya Hieroglyphs. Middle American Research Series 4: 73–102, Dept. Middle Amer. Research., Tulane Univ., New Orleans.

BLOM, FRANS
1932. The Maya Ball-game of Pok-ta-pok. Middle American Papers, Dept. Middle Amer. Research, Tulane Univ., New Orleans.

CRESSON, FRANK M., JR.
1938. Maya and Mexican Sweat Houses. Amer. Anthrop., N. S., 40, No. 1: 88–104.

FEWKES, J. WALTER
1907. The Aborigines of Porto Rico and Neighboring Islands, Bur. Amer. Ethn., 25th Ann. Rept., Washington.
1922. A Prehistoric Island Culture Area of America. Bur. Amer. Ethn., 34th Ann. Rept., Washington.

GAMIO, MANUEL
1926–1927. Cultural Evolution in Guatemala and Its Geographic and Historic Handicaps. Art and Archaeology 22, 23, Washington.

GOWER, CHARLOTTE D.
1927. The Northern and Southern Affiliations of Antillean Culture. Memoirs Amer. Anthrop. Assn. 35.

HARRINGTON, M. R.
1921. Cuba Before Columbus. Indian Notes and Monographs, Museum Amer. Ind. Heye Foundation, New York.

HATT, GUDMUND
1932. Notes on the Archaeology of Santo Domingo. Geografisk Tidsskrift, 35 Bind, 1/2 Hefte, Marts., Copenhagen.

HRDLIČKA, ALES
1926. The Indians of Panama; Their Physical Relation to the Mayas. Amer. Jour. Phys. Anthrop., 9, No. 1: 1–15.
1935. Melanesians and Australians and the Peopling of America. Smithson. Misc. Coll. 94, No. 11, Washington. (Omitted from bibliography of Part I.)

KEMPTON, J. H., AND POPENOE, WILSON
1937. Teosinte in Guatemala. Publication 483: 199–218., Carnegie Inst. Wash., Washington.

LOTHROP, S. K.
1926. Pottery of Nicaragua and Costa Rica. Contributions 8, Museum Amer. Ind., Heye Foundation, New York.

---

[282] It would be obviously impossible to present a bibliography making any pretensions to completeness; an attempt has been made, however, to include in this and the bibliography for Part I all the most important recent works of comparative scope, and in many or most of these, large bibliographies will be found which give the earlier or more detailed sources. A few of the more important of the latter have also been included. Probably some important general works have been overlooked, and for these omissions, partly due to editorially dictated time limitations, I offer apologies to author and reader. Sometimes only an author's latest work in a field has been given, as this generally gives a digest of, and references to, his earlier work. In many cases the text references to these works merely call attention to them, and do not indicate quotations or digests therefrom.

1927. Pottery Types and Their Sequence in El Salvador. Indian Notes and Monographs 1, No. 4: 165–220, Museum Amer. Ind., Heye Foundation, New York.
1933. Atitlan; An Archaeological Study of Ancient Remains on the Borders of Lake Atitlan, Guatemala. Publication 444, Carnegie Inst., Wash., Washington.
1936. Zacualpa; A Study of Ancient Quiche Artifacts. Publication 472, Carnegie Inst., Wash., Washington.
1937. Coclé; An Archaeological Study of Central Panama. Memoirs 7, Peabody Museum, Harvard Univ., Cambridge.

LOVÉN, SVEN
1935. Origins of the Tainan Culture, West Indies, Göteborg.

LUDENDORFF, H.
1930–1937. Sonderausgaben aus den Sitzungsberichten der Preussischen Akademie der Wissenschaften. Berlin.

MASON, J. ALDEN
1935–1937. Reports on current archaeological work in Middle America. Amer. Antiquity 1–4.

MERWIN, R. E. AND VAILLANT, GEORGE C.
1932. The Ruins of Holmul, Guatemala. Memoirs 3, No. 2, Peabody Museum, Harvard Univ., Cambridge.

OSGOOD, CORNELIUS
1935. The Archaeological Problem in Chiriqui. Amer. Anthrop., N. S., 37: 234–243.

POPENOE, DOROTHY H.
1934. Some Excavations at Playa de los Muertos, Ulua River, Honduras. Maya Research 1, No. 2.

RAINEY, FROELICH G.
1935. A New Prehistoric Culture in Puerto Rico. Proceed. Nat. Acad. Sci. 21, No. 1: 12–16, Washington.
1936. A New Prehistoric Culture in Haiti, *id.*, 22, No. 1: 4–8.

RICKETSON, OLIVER G. AND EDITH B.
1937. Uaxactun, Guatemala; Group E—1926–1931. Publication 477, Carnegie Inst. Wash., Washington.

ROTH, W. E.
1924. An Introductory Study of the Arts, Crafts, and Customs of the Guiana Indians. Bur. Amer. Ethn., 38th Ann. Rept., Washington.

ROUSE, IRVING
1937. New Evidences Pertaining to Puerto Rican Prehistory. Proceed. Nat. Acad. Sci. 23, No. 3: 182–187, Washington.

SATTERTHWAITE, LINTON, JR.
1936. An Unusual Type of Building in the Maya Old Empire. Maya Research 3, No. 1: 62–73.

SCHELLHAS, PAUL
1936. Fifty Years of Maya Research. Maya Research 3, No. 2: 129–139.

SCHULLER, RUDOLF
1919–1920. Zur Sprachlichen Verwandtschaft der Maya-Quitse mit den Carib-Arauc. Anthropos, 14–15. San Gabriel Mödling.

SMITH, ROBERT E.
1936a. Preliminary Shape Analysis of the Uaxactun Pottery. Carnegie Inst. Wash., Washington.

1936b. Ceramics of Uaxactun: A Preliminary Analysis of Decorative Technics and design. *id.*

STONE, DORIS ZEMURRAY

1934. A New Southernmost Maya City. Maya Research 1, No. 2: 125–128.

STRONG, W. D.

1935. Archaeological Investigations in the Bay Islands, Spanish Honduras. Smithsonian Misc. Pubs. 92, No. 14, Washington.

THOMAS, CYRUS, AND SWANTON, J. R.

1911. Indian Languages of Mexico and Central America. Bull. 44, Bur. Amer. Ethn. Washington.

THOMPSON, J. ERIC

1931. Archaeological Investigations in the Southern Cayo District, British Honduras. Anthrop. Series 17, No. 3: 230, Field Museum Nat. Hist., Chicago.

1935. Maya Chronology: The Correlation Question. Publication 456: 51–104, Carnegie Inst. Wash., Washington.

1936. Archaeology of South America. Anthropology Leaflet 33, Field Museum Nat. Hist., Chicago.

1937. A New Method of Deciphering Yucatecan Dates with Special Reference to Chichen Itza. Carnegie Inst., Wash., Contributions to American Archaeology 22, Publication 483: 177–197, Washington.

TOZZER, ALFRED M.

1934. Maya Research. Maya Research 1, No. 1: 3–19.

VAILLANT, GEORGE C.

1932. Some Resemblances in the Ceramics of Central and North America. Gila Pueblo, Medallion Papers 12, Globe, Arizona.

1934. The Archaeological Setting of the Playa de los Muertos Culture. Maya Research 1, No. 2: 87–100.

1935. Chronology and Stratigraphy in the Maya Area. Maya Research 2, No. 2: 119–143.

WAUCHOPE, ROBERT

1934. House Mounds of Uaxactun, Guatemala. Publication 436: 107–171, Carnegie Inst. Wash., Washington.

WHORF, BENJAMIN L.

1933. The Phonetic Value of Certain Characters in Maya Writing. Papers 13, No. 2, Peabody Museum, Harvard Univ., Cambridge.

1935. Maya Writing and its Decipherment. Maya Research 2, No. 4: 367–382.

YDE, JENS

1936. A Preliminary Report of the Tulane University—Danish National Museum Expedition to Central America 1935. Maya Research 3, No. 1: 25–38.

CRANIA FROM WYOMING RESEMBLING "MINNESOTA MAN"

W. W. HOWELLS[283]

IN THE summer of 1935, a road gang working in the vicinity of Torrington, Wyoming, near the north bank of the North Platte River, was blasting for road material in the face of a low bluff. Among the debris of one explosion they found several broken skeletons, together with a few stone artifacts and some bone beads. The artifacts were dispersed among the workmen, but the skeletal material, together with a few of the beads, came into the hands of Dr. S. H. Knight, Professor of Geology at the University of Wyoming. On a trip to New York he brought the cranial fragments to the American Museum of Natural History, where they were restored by the author. Although from the manner of their discovery all geological or archaeological documentation of the skulls is lost, they evoke some interest because of their pronounced morphological resemblance, both in general and in particular, to Professor Jenks' "Minnesota Man."[284]

The circumstances of the find were as follows. The road gang, under the Works Progress Administration, was blasting at intervals in the face of the small sandstone cliffs which form the side of the valley of the North Platte. These cliffs vary considerably in size and slope, but the average height is about twelve feet, and they are topped by moderately level plains formed on the horizontal beds of Oligocene and Miocene sandstone. The cliffs themselves are Oligocene material. Nothing remarkable was noticed with regard to the cliff before this particular piece of blasting, but in the debris were found the remains of several individuals, mostly in fragments, together with some stone tools and bone beads; it was apparent that these had all lain in some kind of a pocket in the cliff which was filled with unconsolidated earth. Most of the skeletal material was retrieved by the foreman of the crew, but the stone artifacts, whatever they were, appear to have been kept by the workmen themselves.

The University was apprised of the discovery by an article in the

---

[283] American Museum of Natural History, New York City.

[284] Jenks, A. E., Pleistocene Man in Minnesota, A fossil *Homo sapiens* (with a chapter on the Pleistocene geology of the Prairie Lake region, by George A. Theil), 197 pp., Minneapolis, 1936. The author wishes to thank Professor Jenks for providing him with photographs of the Minnesota skull, and for permission to reproduce them in the plates which accompany this paper.

local newspaper, and Mr. Raymond Nace, an assistant on the staff of the Wyoming Geological Survey, visited the site of the find and obtained the skeletons, which had been brought by the foreman to his office in Torrington. Thanks are due to Mr. Nace for all the information regarding the discovery. When he first saw the spot, later in the fall, the debris had been carried away, so that all that remained was the new face of the cliff created by the dynamiting. On this surface was a blackened area which was obviously not freshly cut by the explosion, but which had formed the rear wall of a cave or of a crevice opening from the top. This area was more or less circular and appeared to have a passage running up to the top, indicating a flue or a vertical opening to the cavity. Everything else relating to this cave had been destroyed. However it is clear that it had been filled with the unconsolidated dirt which contained the skeletons, which were, of course, unrelated to the sandstone. It might have been a crevice, opening only in the surface above the cliff, but the fact that no opening, or difference in material, was noticed in the face of the cliff may not, under the circumstances, mean that none existed, and the presence of the blackened rock surface indicates that the vertical flue served as a chimney to a habitable cave.

As to the antiquity of the material, it is probable that even had the deposit been excavated carefully the evidence, aside from the artifacts, would have been equivocal. There is nothing to show that the remains are ancient, but the circumstances do not make it impossible. The earth containing them was undatable. The bones are light but not brittle, and are in excellent condition, showing no signs of decay or weathering. They apparently represent intentional burials. They were probably originally covered up out of reach of water within the cave, as the sandstone is impermeable, while it is likely that the cave (or crevice?) was filled up through the flue by rainwash, which probably happened rapidly, so that thereafter little water entered the cavity from any direction. In any case, the region is a semi-arid one and has been so for a long time.

The skeletal material recovered comprises four individuals. One is a small child represented only by the petrous portions of the temporals, the malars, and a portion of the mandible with a few teeth. Of the adults (Plates 13–16), Skull I is that of a male of early middle age, and was badly broken, only the frontal bone and the mandible being nearly complete, while the nasal bones and the base of the skull are missing. However, there were numerous points of articulation between the remaining parts, and it was possible to make a satisfactory restoration. Skull II is that of a young female, and consists only of the upper cranial

vault, comprising most of the frontal and parietals, with the occipital squama; the upper ends of the nasalia and maxillae are also present. Skull III, that of a middle-aged female, is the most complete, the principal deficiencies being the nasalia and the internal bones of the face and a portion of the mandible immediately to the left of the symphysis. Allowing in the case of Skull I for the difference in sex, a strong general likeness in character may be seen between these skulls and that known as "Minnesota Man."

"Minnesota Man" is at present the center of a warm controversy. Professor Jenks has championed the find since its discovery, and the greatest difference of opinion arises over the question of its geological antiquity, with plenty of authority on either side. Jenks has recently published an excellently detailed description of the skeleton[285] itself, in which he was led to conclude that, for *Homo sapiens*, it is very primitive, and that it represents a proto-Indian Mongoloid type. Of its individual characters he considered that a large majority were uniformly primitive. His discussion appears to imply that such a skull could not be found among modern Indians, its primitiveness being further proof of its antiquity.

This proposition has been severely criticized by Hrdlička,[286] who feels that Professor Jenks has overstated his case with regard to the physical characteristics of the skeleton, regardless of the geological merits of the question. He says (p. 199): "On the whole should a professional and experienced . . . physical anthropologist be given the task of proving by its somatic characteristics the Minnesota skull as ancient, or even really primitive, he would have to give up in despair." He shows that several of the allegedly primitive characters of the skull (viz., occipital protrusion, poor development of nasal sills and spine, and alveolar prognathism) are by no means unknown in modern Indians, including the Sioux, the latest occupants of the area of the find. He also tabulates a number of the measurements, least affected by age, of the Minnesota skull with the corresponding means of two groups of adult female Sioux crania, a process which gives a very close correspondence throughout. Therefore, "If somatological diagnosis is worthy of its name, the Minnesota specimen must be adjudged as inseparable from the Sioux."[287]

---

[285] That of an adolescent girl, about fifteen years of age.

[286] Hrdlička, A., The Minnesota "Man." American Journal of Physical Anthropology, Vol. 22, No. 2, pp. 175–200, 1937.

[287] Hrdlička, *op. cit.*, p. 193.

TABLE I

MEASUREMENTS OF WYOMING CRANIA AND "MINNESOTA MAN"

Sex	I Male	II Female	III Female	Minnesota Female Skull	41 Sioux crania (Hrdlička) Female
Age	Young Middle	Young	Middle	15–16	Adult
Glabello-occipital length	190 ?	178	181 ?	179	178
Maximum width	138 ???	131 ??	138 ?	138	138
Cranial index	72.6	73.6	76.2	77.1	77.7
Basion-bregma height			122 ?	127 ?	126
Length-height index			67.4	70.9	70.6
Breadth-height index			88.4	92.0	90.5
Auricular height	111 ?		109 ?	116	
Auricular length-height index	58.4		60.2	64.8	
Basion-nasion length			97 ?	94 ?	
Basion-prosthion length			101 ?	94 ?	
Gnathic index			104.1	100.0	
Horizontal circumference	523 ?	500 ???	506	495	
Transverse arc	290 ?		292	309	
Sagittal arc	368 ??		360	356	352
Frontal arc	122	119	117	115	
Parietal arc	124	125	116	119	
Occipital arc	122 ??		127	122	
Minimum frontal diameter	93		93	93	93
Bizygomatic diameter	141 ??		129 ?	125 ?	133.0
Nasion-menton height	114 ?		114 ?	114.5	114.3
Facial index	81.6		88.4	91.6	86.3
Nasion-prosthion height	77 ?		74 ?	67	71.0
Upper facial index	54.6		57.4	53.6	53.5
Orbit height, right	35 ??		33 ??	34	35.6
Orbit height, left	33 ??		31 ?	34	
Orbit breadth, right	39 ?		40 ???	38 ?	38.6
Orbit breadth, left	41 ?		38 ???	38 ?	
Orbital index, right	89.7		82.5	89.5	92.3
Orbital index, left	80.5		81.6	89.5	
Interorbital breadth	25 ?	22	23 ?	19.5 ?	
Biorbital breadth	102		98	92.5	
Interorbital index	24.5		23.5	21.1	
Nasal height	54 ?		52 ?	47	51.9
Nasal breadth	27 ?		23	21	24.9
Nasal index	50.0		44.2	44.7	49.3
Condylo-symphysial length	113 ???		105 ?	107	
Bicondylar width			117 ??	115	
Bigononial width	108		88 ??	94	99
Height of symphysis	35 ?		30 ??	30	32
Minimum breadth, ascending ramus	35		29	34	37
Total facial angle	78°		81°	87°	

N. B. Question marks opposite measurements indicate degree of uncertainty due to restoration. It is probable that no measurement is inaccurate by more than 3 millimeters.

Dr. Hrdlička's critique has the effect of minimizing any tendency to regard the skull as a definitely low human form, or as standing apart from the American Indian race group. Yet some defense of the find against this criticism may be offered. In the first place, the comparison of the measurements is not necessarily conclusive. When the racial identity of a single skull is to be determined, one must rely on morphological features, for it is a rare skull which conforms throughout to the means of its own group.

Dr. Hrdlička is also right in pointing out that the primitive characters of the skull may be found occasionally in all Indians, including the Sioux. However, the Minnesota skull, taken as a whole, presents not only an extreme combination of such traits, but has a morphological character of its own which would make it noticeable in any group of Indian skulls. It is typologically unusual; such a form does occur infrequently in known Indian crania, but if the skull is that of a Sioux it is hardly "the characteristic type," as Hrdlička calls it.

The Wyoming skulls, as has been said, not only have an identity of general character with the Minnesota skull, but share a large number of the individual features which are found in the latter (Plates 13–16), though in some cases these are less pronounced. These characteristics are described below. A number of the features by which Dr. Jenks claims the Minnesota skull to be distinguished are of uncertain significance, but the more important ones may be treated comparatively.

Measurements: These are not very informative, and for the most part do not refute Hrdlička's claim that they are typical of the Sioux. Compared with the Minnesota skull, the Wyoming skulls are lower in the vault, as is revealed by the auricular height and the transverse arc. They also tend to be more dolichocranial. That their alveolar prognathism is greater than in the Minnesota specimen appears from the measurement of the total facial angle (nasion to prosthion), which in these cases is a low figure such as is found in Australians, Melanesians, and Negroes, but also in Indians of the Northwest Coast.[288] The basion-prosthion length and the gnathic index of Skull III are higher than in most Indian groups,[289] though here again similar values are found in Northwest Coast crania. No figures for these characters are recorded in

[288] Oetteking, B., Craniology of the North Pacific Coast, Memoirs of the American Museum of Natural History, Vol. 15, Part 1, Leiden, 1930.

[289] Hooton, E. A., The Indians of Pecos Pueblo, A study of their skeletal remains, Papers of the Phillips Academy Southwestern Expedition, No. 4, 391 pp., New Haven, 1930.

Skull I

Skull I
Nasal Region

Skull III

Minnesota Skull

Wyoming and Minnesota Crania, Norma Facialis

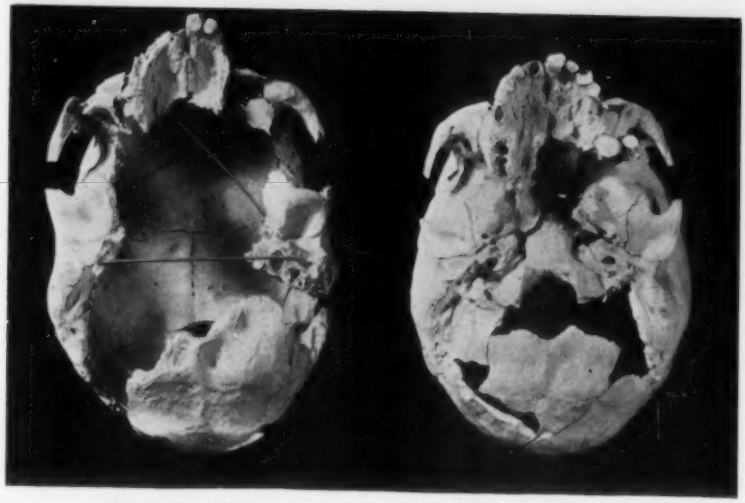
Skull I

Skull II

Skull III

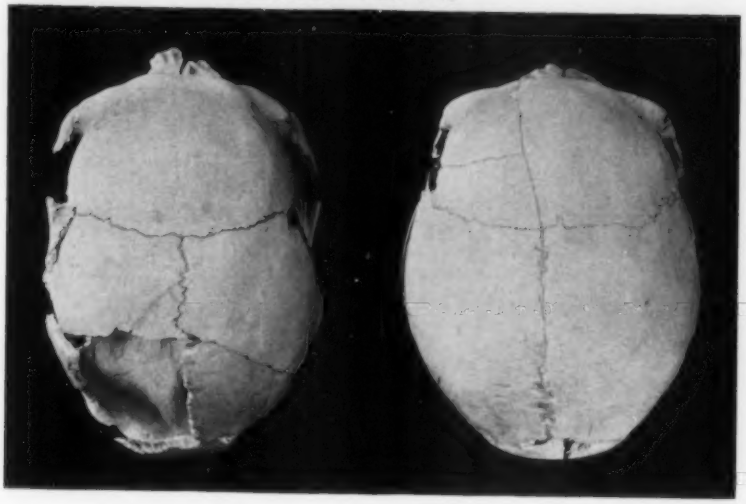
Minnesota Skull

Wyoming and Minnesota Crania, Normal Lateralis



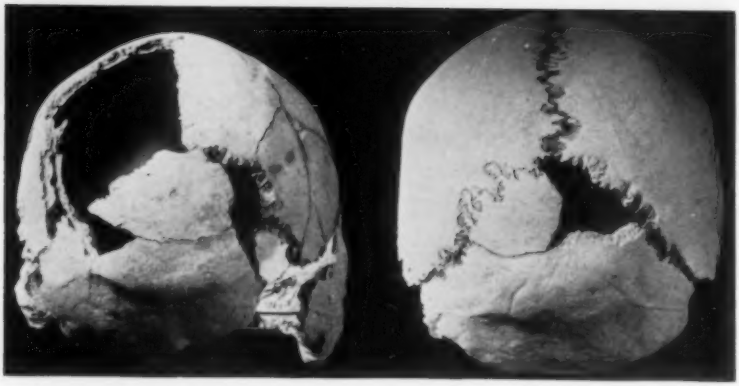
Skull I Skull III

Norma Basilaris

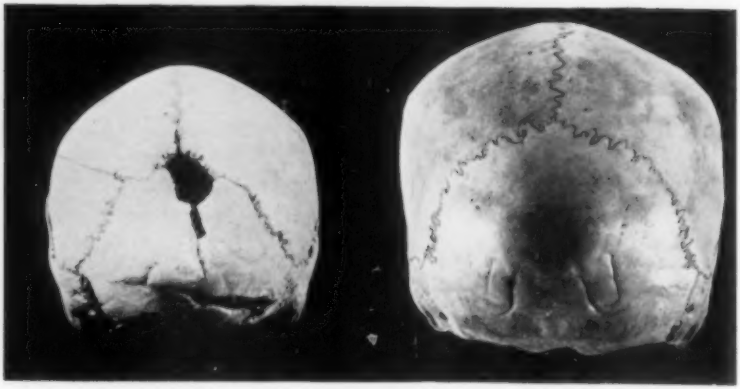


Skull I Skull III

Wyoming Crania, Norma Verticalis



Skull I Skull II



Skull III Minnesota Skull

Wyoming and Minnesota Crania, Norma Occipitalis

the table of measurements for Skull I, but by approximating them from a hypothetical basion point, since the basion is missing, a gnathic index of well over 100 is obtained.

Cranial vault: On the whole, this is not distinguished in any particular way in these specimens. The supraorbital ridges in the male skull are somewhat above medium size. In all three skulls the sagittal region is elevated, as may be seen from the photographs, but not to an unusual degree. The suturing, while fairly simple, is not more so than in other Indian crania, which is also true of the Minnesota skull. As to the occipital region, Professor Jenks here discerns a number of primitive or unusual characters in the Minnesota individual which, however, do not seem superficially to be as important as he believes. The general character of the occipital bone is not of striking appearance. Two features to which Jenks draws attention are the general protrusion of the occiput and the length of the arc from lambda to opisthion, the latter being well above the female means of most racial groups in its proportion to the total sagittal arc. As to the first, the occiput is not markedly protuberant with relation to the whole vault, and in any case it is not certain that in *Homo sapiens* a protuberant occiput is necessarily a primitive character. As to the length of the occipital arc (122 mm.), Hrdlička finds Sioux individuals which equal it, absolutely and in proportion, and in the case of Skull III it is considerably exceeded.

An arresting feature of the Minnesota occiput is to be seen in the U-shaped grooves (Plate 16) on either side of the inion. Their significance is unknown. There is no published example of a cranium showing an equal development of this anomaly, and Dr. Jenks publishes a photograph of the only other specimen of his acquaintance showing any signs of it. While it is undoubtedly rare, it does occur occasionally in the collections of the American Museum of Natural History. It is interesting that both the female specimens from Wyoming exhibit traces of the formation, perhaps not quite as well marked as in the case of Dr. Jenks' second example.

Facial region: The upper part of the face of these skulls contains nothing which is out of the ordinary for Indians. Skull II, the only one retaining part of the nasal bones, exhibits no depression of the nasion.

The lower part of the face, however, is characterized by a combination of undefined nasal sills and alveolar prognathism which is extreme. The degree of prognathism has already been shown by the nasion-prosthion angle and the gnathic index to be exceptional, surpassing that in the Minnesota skull. Hrdlička reports that twenty-five

per cent of Sioux female crania have a "marked slant" of the alveolar border, but this division probably includes few such pronounced examples as the present ones. Hooton[290] classifies about one per cent of the male Pecos skulls and about six per cent of the females as having "very pronounced" alveolar prognathism, a degree which would correspond to that in the Wyoming crania. Among Northwest Coast crania pronounced prognathism is more general, though in this case the whole face is prognathous, the alveolar projection being more moderate.

As to the lower borders of the nasal aperture, there is no definition of these in Skull I, the male, although there are no subnasal gutters as in the Minnesota skull. In Skull III, however, the lower borders are dull but nevertheless present, a type which occurs not infrequently in Siouan and other Indian crania. Hrdlička found this degree of definition in twenty-five per cent of Sioux females, which agrees with the author's experience. But it is probable that very few Sioux crania have the complete absence of a sill seen in Skull I; Hooton found such a condition in about 1.5 per cent of the Pecos males and three per cent of the Pecos females, and Sullivan[291] observed it in 1.3 per cent of all Indian crania. A somewhat higher rate occurs only in Eskimos and Mexican Indians.[291] Eskimo crania also exhibit high degrees of alveolar prognathism, either in conjunction with a prenasal sulcus or not.

A further point of resemblance between the Wyoming and Minnesota skulls lies in the pitch of the palatal vault immediately behind the alveolar border, which is very gradual.[292] This is unusual, as even in cases with marked alveolar prognathism there is generally a discernible angle in the sagittal plane of the palate at a point in the region of the premolars. However, although breakage and absorption make it difficult to tell, the palate in both the Wyoming skulls was probably low, and the slope of the post-incisive region is probably influenced by prognathism. Skull I has a good-sized mound-shaped torus along the sagittal suture, which, however, seems to be independent of the slope of the palate described above.

There is nothing unusual about the teeth. They are well worn, but they were plainly not of the large size of those in the Minnesota skull. The bite is of the edge-to-edge type with, in both skulls, some irregular

[290] Hooton, *op. cit.*

[291] Sullivan, L. R., The frequency and distribution of some anatomical variations in American crania, Anthropological Papers of the American Museum of Natural History, Vol. 23, Part 5, New York, 1922.

[292] Jenks, *op. cit.*, Figure 51.

wearing of the molars. The mandibles present no features of interest.

Summary: In gross character and in a number of specific features, the likeness between the Wyoming skulls and the Minnesota specimen is strong enough to postulate, under ordinary circumstances, that they are representatives of the same racial group. How, then, does this apply to the problem of the affinities of "Minnesota Man"?

One may not deny Hrdlička's argument that the Minnesota skull (and therefore the present ones) cannot be separated from the Sioux on the basis of measurements, and that in fact the evidence runs the other way. Furthermore, the several supposedly distinctive characters of the Minnesota skull may be found in recent Indians. He also points out the fact that the Sioux and related peoples are, as a type, more or less distinct. However, one might feel justified in being reluctant simply to identify all these crania, or at least those from Wyoming, as those of Sioux.

In the first place, such a totality of unusual characters as each presents would certainly be unexpected in a Sioux series, and considered subjectively, they do not look like Sioux crania; their distinctive appearance has already been remarked. Nevertheless, one cannot deny that the Sioux people might produce such individuals. At Pecos Pueblo one might expect to find one man or six women in each hundred of either sex to be equally prognathous with the Wyoming skulls, which proportion, according to the author's experience, may not unreasonably be expected among Sioux. One might also expect twenty-five Sioux women in a hundred to have as poorly defined a nasal sill as Skull III, and certainly not more than two Sioux men in a hundred to lack it entirely, as does Skull I. Now, whatever their evolutionary connection, there is almost no general association between prognathism and lack of nasal sill within a particular racial group; in other words, they are independent and not physically connected. Therefore, one would not expect more than two or three Siouan (or Pecos) female crania in a hundred to have the same development of the lower nasal and alveolar region as Skull III, and not more than one male cranium in five thousand, or at most in one thousand, to resemble Skull I in these respects. As to the prospect of finding, associated with one another in the same burial, two Siouan skulls of the type of I and III respectively, this seems from the above figures to have a probability of not more than three chances in a hundred thousand.

However, this argument does not disturb Hrdlička's assertion that the cranial characteristics of "Minnesota Man" (and therefore of the

Wyoming crania) do not show it to be either ancient or primitive, since the Eskimo of today exhibit the more important of these characters relatively frequently. There is no reason to suppose that the crania are not of Indian origin. It may be remarked that, of other crania whose antiquity has been a matter for discussion, the Wyoming and Minnesota skulls do not resemble either the Punin or Lagoa Santa skulls. They share with the so-called *Homo novusmundus*[293] the characters of alveolar prognathism and undeveloped nasal sills, and something of a similarity of form, though not a great affinity in measurements; this is a skull of undetermined, but possibly considerable, age, and its general degree of primitiveness is about equal to that of the skulls herein described.

The general bearing of the Wyoming crania on the case of "Minnesota Man" seems to be as follows. If they are Sioux, or a similar type, then Dr. Hrdlička's diagnosis is correct in every detail, and the physical type of "Minnesota Man" is of no special interest. In this case the ordinary range of Indian morphology becomes sufficiently extended so that such specimens as the Minnesota skull and *Homo novusmundus* need cause no comment, and the finding of two such crania together in Wyoming is mere coincidence. On the other hand, it is a reasonable probability that the earliest arrivals in this continent were distinctly Indian racially, even though their coming was relatively remote in time, but that they were characterized by a slightly more primitive physical type, exemplified perhaps by that of the Wyoming and Minnesota skulls. The question cannot be settled by evidence so far established.

---

[293] Figgins, J. D., New World Man. Proceedings of the Colorado Museum of Natural History, Vol. 14, No. 1, 5 pp., 1935; Roberts, F. H. H., Jr., New World Man. AMERICAN ANTIQUITY, Vol. 2, No. 3, pp. 172–177, 1937.

HOPEWELLIAN TRAITS IN FLORIDA

E. F. GREENMAN[294]

THE RESEMBLANCE of certain objects from the Crystal River Mound in Florida to others taken from mounds of the Hopewell culture in Ohio was first noted by Shetrone in 1931.[295] Willoughby[296] discussed a certain type of design on a round copper plate, interpreted by him as representative of the foot of a bear, and commented upon the presence of such Hopewell-like objects as plummets of shell, stone, and copper, copper ear spools, and conjoined copper tubes. The resemblances between these widely separated mound groups are much more numerous than have been listed in any publication up to the present date, but the Crystal River Mound and other related mounds in Florida have been denied inclusion in the Hopewellian culture for the reason that most of the pottery found in them is not of the Hopewell type.

In addition to the Crystal River Mound, Clarence B. Moore describes fifty others, along the shores of bays on the northwest Florida coast, and on the St. Johns River, which appear to be related to it, and to the Hopewellian mounds of Ohio, Michigan, Wisconsin, and Illinois.[297] The writer has selected seventeen of these mounds to ascertain the degree of relationship to the northern manifestion generally referred to as the Hopewellian Phase. The objects from these Florida mounds have not been personally examined, entire dependence being placed upon Moore's descriptions and illustrations. All figures pertaining to traits given in the present paper are tentative. Closer examination of specimens in the future should reveal a larger number of traits, both for the Hopewellian and for Florida.

The number of traits for the Hopewellian based upon descriptions of artifacts, constructional features of mounds, and burial types, for the major mound groups of Ohio, Wisconsin, Illinois, and Michigan, is 321.

---

[294] Asst. Curator, Division of Great Lakes, Museum of Anthropology, University of Michigan, Ann Arbor.

[295] Henry Clyde Shetrone, The Mound Builders, New York, London: D. Appleton and Company, p. 456, 1921.

[296] C. B. Moore, Certain Aboriginal Mounds of the Central Florida West-Coast. Journal, Academy of Natural Sciences of Philadelphia, 12, pp. 409–410, 1903.

[297] Moore, Clarence B., in Journal, Academy of Natural Sciences of Philadelphia, various reports from 1900 to 1916.

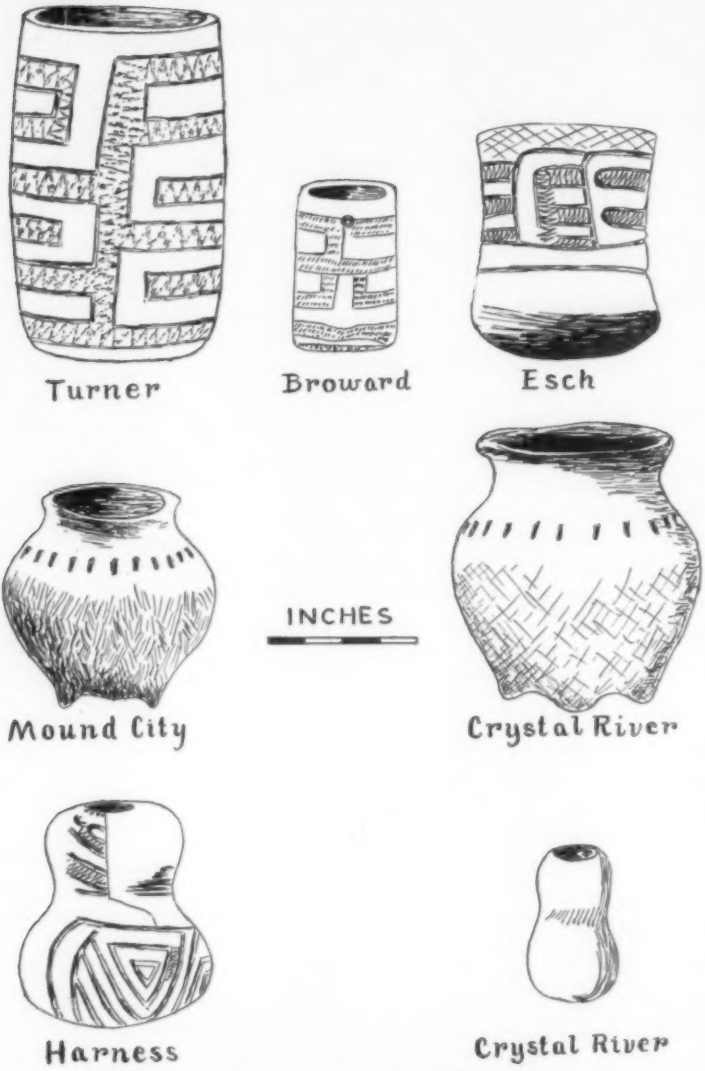


FIG. 19.—Pots from Hopewell mounds in Ohio compared with similar ones in Florida mounds.

The seventeen Florida mounds exhibit 133 of these.[298] Of the diagnostic traits listed in Table I, the Florida mounds possess seventeen, as compared to twelve for the Hopewellian mounds of Wisconsin.[299] The apparent superiority of the Florida over the Wisconsin groups is vitiated by the fact that the former contain a wide variety of non-Hopewellian pottery traits, whereas the non-typical features of the latter are

FIG. 20.—Sherds from the Crystal River Mound, Florida, resembling others from the Hopewell and Seip Mounds, Ohio.

limited to such occurrences as bundle burials, mounds in linear arrangement, sub-floor burial chambers, and clay masks.

Figures 19 and 20 illustrate a number of similarities in pottery

[298] Descriptions of the seventeen Florida mounds are in the Journal of the Academy of Natural Sciences of Philadelphia, 13 in the following volumes: Crystal River Mound, 12, 379–413; 13, Part 3, pp. 406–425; Alligator Bayou Mound, 12, pp. 150–152; Pierce Mounds, 12, pp. 217–229; Anderson Bayou Mound, 12, pp. 160–163; Shields Mound, 10, pp. 9–15; Grant Mound, 10, pp. 30–51; Broward Mound, 10 p. 53; Murphy Island Mound, 10, pp. 63–76; Reddie Point Mound, 10, pp. 54–55; Tick Island Mound, C. B. Moore, Certain Sand Mounds of the St. Johns River, Philadelphia: Levytype Company, Part 2, pp. 148–158, 1894; Mount Royal Mound, *ibid.*, pp. 130–146.

[299] A total of fourteen mounds; W. C. McKern, A Wisconsin Variant of the Hopewell Culture, Milwaukee Public Museum, Bulletin 10, No. 2, 1931; L. R. Cooper, The Red Cedar River Variant of the Wisconsin Hopewell Culture, Milwaukee Public Museum, Bulletin 16, No. 2, 1933.

shapes and types of decoration between the mounds of Florida and Ohio. The top row in Figure 19 shows three pots with fundamentally similar shapes and decoration. The pot on the left is from the Turner group near Cincinnati, Ohio.[300] The small vessel in the center was taken by Moore from the Broward Mound in Florida,[301] and the one to the right is from one of the mounds of the Esch group, near Huron, Ohio, excavated by the writer in 1930 for the Ohio State Archaeological and Historical Society.[302]

In the middle row in Figure 19 are two pots which are identical in all features determinable from the illustrations, with the exception of the paddle marking on the body. The vessel to the left is from the Mound City group, Chillicothe, Ohio;[303] the other is from the Crystal River Mound in Florida.[304]

In the lower row, Figure 19, are two composite globular vessels of a type which is common in the Florida mounds under discussion. The one at the left was taken from a mound of the Harness group in Ohio previous to its exploration by Mills, and is in the Peabody Museum, Harvard University. It was evidently secured by Putnam and Metz in their excavations, but no mention of it is made in their list of objects from the Harness group.[305] It is described by Willoughby[306] as from the Liberty Group, which is an earlier name for the Harness group. Plate 17 is the only published photograph of this pot. On the upper body is a design representing a bird, with a border formed by the bisected cone near the lip. The "roulette" or rocker pattern occurs in the areas between lines on both upper and lower bodies. The other double pot shown in Figure 19 was taken from the Crystal River Mound.[307]

In Figure 20, top row, are three sherds from the Crystal River Mound, beneath which are sherds showing similar decoration from Hopewell mounds of Ohio.

---

[300] Willoughby, Charles C., The Turner Group of Earthworks, Hamilton County, Ohio, Papers of the Peabody Museum of American Ethnology and Archaeology, 8, No. 3, Pl. 23, Harvard University, Cambridge, 1922.

[301] Moore, C. B., *op. cit.*, pp. 79, 2.

[302] Report in preparation.

[303] Mills, William C., Certain Mounds and Village Sites of Ohio, Fig. 41, p. 334, Columbus, 1922.

[304] Moore, C. B., *op. cit.*, Vol. 12, Fig. 34.

[305] 18th and 19th Annual Reports, Peabody Museum of American Archaeology and Ethnology, Vol. 3, Nos. 5 and 6, p. 426, Cambridge, 1886.

[306] *Op. cit.*, p. 92.

[307] Moore, C. B., *op. cit.*, Part 3, Fig. 8.

Of the entire group of Florida mounds, the Crystal River has the largest number of Hopewellian traits, some of which do not appear in the list of diagnostic traits given herewith; as for example, mica sheets, containers made of large marine shells, the wrapping of copper artifacts in woven fabric, and the "ceremonial" destruction of a large number of stone celts,[308] a parallel for which was found in the Hopewell Mound in Ohio.[309] Shallow bowls with wide, flat, overhanging lips were also common to the Crystal River[310] and Hopewell[311] mounds; and sherds with curvilinear stamped designs are abundant in the Florida mounds under discussion,[312] but present sparingly in mounds of the Hopewell culture in Ohio,[313] where, like composite globular pots and the large zoomorphic tubular steatite pipes of the Seip Mound, they are rightly regarded as atypical, and reminiscent of southern influences.

The non-typical traits occuring in the Florida mounds relate chiefly to the pottery, where forms occur which have not yet been satisfactorily placed in the culture classification. Among these forms are water bottles, shallow bowls divided into compartments, effigy vessels, small crucible-like cups, mortuary vessels with open work patterns, and types of decoration not as yet observed in Hopewellian mounds of the northern states. It is because of these aberrant forms that these mounds in Florida have not yet been included with the Hopewellian. One possibility suggests itself: these mounds may represent two different occupations. Very little stratigraphical information is to be found in the descriptions of them. Otherwise, the divergence of the Florida Hopewell from that of southern Ohio appears to be of the same type as that between southern Ohio and Wisconsin, or southern Ohio and Illinois.

---

[308] *Ibid.*, p. 397.

[309] Shetrone, H. C., Exploration of the Hopewell Group of Prehistoric Earthworks, Ohio State Archaeological and Historical Quarterly, 35, No. 1, pp. 116–119, 1926.

[310] Moore, C. B., *op. cit.*, Vol. 12, Fig. 33.

[311] Shetrone, H. C., *op. cit.*, Fig. 52.

[312] Moore, C. B., *op. cit.*, Vol. 12, Fig. 20.

[313] Willoughby, C. C., *op. cit.*, Plate 24, Q: H. C. Shetrone, E. F. Greenman, Explorations of the Seip Group of Prehistoric Earthworks, Ohio State Archaeological and Historical Quarterly, Vol. 40, No. 3, Fig. 52, B, 1931.

TABLE I

A tentative list of diagnostic Hopewellian traits	Wisconsin	Florida
Awls, deer cannon bone, split		x
Bars, copper, elliposidal, perforated[214]	x	
Bars, shell, ellipsoidal, curved, perforated[215]		
Breastplates, copper	x	x
Designs, geometrical, cut out of copper or mica[216]		x
Designs, incised on bone or shell[217]		
Earspools, copper, plain	x	x
Earspools, copper, embossed or perforated		
Earspools, copper, open work design		x
Earspools, copper, silver-covered		x
Earspools, copper, iron-covered		x
Effigies, antler, copper-covered wood		x
Effigies, bear foot, copper[218]		x
Effigies, bear claw, bone or stone		
Effigies, hollow stone[219]		
Jaws, animal, worked		x
Noses, copper		
Pipes, platform	x	x
Projectile points, obsidian, Hopewell type[220]		
Projectile points, obisidian, curved	x	
Projectile points, imitation in mica		x
Rods, copper, with bone handles		
Spindles, copper[221]	x	x
Teeth, canine carnivore, imitation in stone, etc.		x
Teeth, canine, bear, set with pearls, mitred, etc.	x	
Teeth, alligator, imitation in copper		
Tubes, copper, conjoined	x	x
Large ceremonial celts[222]		
Pottery, body lobes, with feet	x	x
Pottery, roulette design	x	x
Pottery, bisected cone design	x	
Pottery, cross-hatch design	x	
Pottery, head of spoonbill duck, incised		
Geometric earthworks		
Altars		
Crematory basins		
Burial platforms		
Gravel covered primary mounds		

[214] McKern, W. C., *op. cit.*, Plate 54, lower.
[215] Shetrone, H. C., Greenman, E. F., *op. cit.*, Fig. 54, B.
[216] Shetrone, H. C., *op. cit.*, Fig. 151.
[217] Shetrone, H. C., *op. cit.*, Figs. 148, 149; Shetrone, H. C., Greenman, E. F., *op. cit.*, Fig. 56, A.
[218] Shetrone, H. C., *op. cit.*, Fig. 152, 7.
[219] Shetrone, H. C., Greenman, E. F., *op. cit.*, Fig. 44.
[220] Shetrone, H. C., *op. cit.*, Fig. 64.
[221] Shetrone, H. C., *op. cit.*, Fig. 99.
[222] Shetrone, H. C., Greenman, E. F., *op. cit.*, Fig. 28.

A composite globular pot from a mound of the Harness Group, Ohio. The design on the upper portion represents a bird. (Courtesy of the Peabody Museum, Harvard University.)

FIG. 1.—Pottery jar recovered intact from a rock shelter near Windsor, Broome County, New York. Note the round bottom, constricted neck, triangular plats filled with parallel lines, and the castellations.

FIG. 2.—Restored pottery jar from a burial on the Dutch Hollow site, Livingston County, New York, showing notched collar.

FIG. 3.—Pottery jar recovered intact from a burial on the Dutch Hollow site, Livingston County, New York, illustrating the vertical parallel lines cutting horizontal rows of decoration.

AN ANALYSIS OF IROQUOIAN CERAMIC TYPES

JOHN H. BAILEY[223]

THE MANY Iroquoian village and camp sites scattered throughout New York, Pennsylvania, New England, and Ontario, have produced innumerable pottery fragments but relatively few perfect vessels. Many sherds come from the village refuse dumps, for the Iroquois were a cleanly people, and it is only after the advent of the historic period that we find pottery jars and other goods in the graves. Our problem deals with this mass of fragmentary and intact pottery. What are the characteristics which all this material has in common, and what does the decorative design show us concerning the relation between the potter of the older, or prehistoric, and the potter of recent periods? Does the design tell us that the potter was motivated by some age-old tribal pattern, or was his individuality allowed to express itself? What can this pottery show us of the migratory wanderings of the Iroquois, or of what tribes they encountered and whose pottery they may have copied, as the pottery of the late Algonkin people in New York was influenced by the influx of the Iroquois?

Let us first consider the characteristics which we may take as being fairly uniform in Iroquoian pottery, whether it be from Ontario, New York, Pennsylvania, or New England. This typical jar has a globular body, round bottom, varying constriction of the neck, and a flaring or over-hanging collar. It was on the collar that the individual or regional pattern found expression. The lip may be flat or have castellations or points, usually four in number. When the collar is rectangular or square, these castellations are at the corners. The decorative design was incised with some implement such as a blunt bone awl, and the drawn lines were straight, or nearly so, with an almost complete absence of curves or spirals. There is no decoration inside the collar although very rarely short vertical lines may be found on the inside within an inch of the edge of the lip.

But where is the prototype of this typical form? On certain early Iroquoian sites one sees a style of ware which might have been this prototype. Some of the examples have straight sides and no collar. All have round bottoms and their entire exterior covered with the impression of a fabric-wound paddle. Often the same site produces a slightly more advanced form with an incipient collar bearing the incised chevron design. The Burning Springs site in Cattaraugus County, excavated by

[223] Champlain Valley Archaeological Society.

Parker,[324] and other sites in the Cattaraugus valley produced this form in what he calls the Generalized Iroquois manifestation. Mr. Ross Pier Wright excavated a very large site near Westfield, Erie County, on which this early form coexisted with the collared type bearing castellated and well defined rims, with no evidence of the notched rim. Ritchie found this form on an old earthworks in Elk County, Pennsylvania, also accompanied by the typical incised chevron design on a faintly defined rim. It has also been found in northern Ohio by Greenman. Since this type has been found in the part of New York State where the earliest bands of Iroquois are believed to have entered, is it ancestral to the latter Iroquois pottery, or does it represent a form borrowed by the early Iroquois from a possible Algonkin people? The presumption is that it represents the true early Iroquoian pottery.

Probably the most characteristic form of Iroquoian collar decoration is a series of triangular plats (Plate 18, Figure 1), each triangle filled with a group of lines parallel to one side of the triangle, and each alternate triangle having its filler lines parallel. These plats may extend to the lip or to a row of one or more encircling parallel lines. Below the plats is usually a row of oval, vertical impressions encircling the lower border of the collar. This form of decoration is encountered in profusion on all prehistoric Iroquoian sites, and to a lesser degree on most historic ones. We have chosen to call this design the Pan-Iroquoian type. It is the prevalent form on prehistoric sites such as Richmond Mills,[325] Belcher, and California Ranch, all of which are in Ontario County in the region of the small Finger Lakes, as well as in sites of northern, southwestern and southern New York and the Susquehanna valley in Pennsylvania. However, this is not the exclusive form found. Many of these sites have produced the notched or scalloped rim variety to be described later. It is probably safe to postulate that further investigation will prove that the triangular plat filled with parallel lines is diagnostic of prehistoric Iroquoian pottery and that it also extends into historic times in a modified form, while the toothed or scalloped form will be shown to be dominant in historic times. Parker[326] advances this theory in his report on the Factory Hollow site in Ontario County, where the sherds with triangular plats filled with incised lines were

[324] Parker, Arthur C., A Prehistoric Iroquoian Site, Researches and Transactions of the N. Y. State Archeological Assn., Vol. 1, No. 1, Feb., 1918.

[325] Parker, Arthur C., Burning Springs Prehistoric Iroquoian Site, Archaeological History of New York, Part I, N. Y. State Museum Bulletin 235: 162–170.

[326] Parker, Arthur C., A Contact Period Seneca Site, Researches and Transactions of the N. Y. State Archeological Assn., Vol. 1, No. 2, Rochester, 1919.

found at the bottom of the hillside dumps, and in some instances were separated by an overwash of clay and soil from the layers containing the notched rim sherds. Several sherds illustrated in that report show both the triangular plat and the notched form combined in one collar, giving evidence that perhaps this site was occupied continuously during the transition period, or, as portrayed by the separating layer of top soil, at two different periods in the fictile development of the Iroquois. The former theory is more likely correct since the Iroquois did not make a practice of returning to a deserted village.

Let us consider one site from which a fairly large collection of pottery jars, representing most of the common forms, has been recovered, and compare these with similar designs from the northeastern United States. In the fall of 1934, a field party from the Rochester Museum of Arts and Sciences, under the direction of Arthur C. Parker and William A. Ritchie, excavated the burial group of a Seneca village of early contact age (CA. 1630 A.D.) in Dutch Hollow near the village of Lima, Livingston County, New York. From the eighty-five burials, there were recovered thirty-three pottery jars representing nearly all the forms common to the Iroquoian territory. Let us take this as our type site. Many of the pottery specimens had been crushed by the weight of the earth or by large stones laid over the skeletons, but all have lent themselves to accurate restoration.

From this collection of thirty-three vessels, twenty-one (sixty-three percent) had in common a narrow collar, the lower edge deep cut by a row of notches forming teeth or petals; these support our previous theory that such a design should predominate on a historic site. Some of the jars had a very narrow collar and only the notches for the decorative motif. Others had several rows of lines circling the jar between the lip and the notches (Plate 18, Figure 2), while a few had a row of short oblique lines.

Since such a good percentage of our specimens have this common characteristic, it should be of wide occurrence in the Iroquoian area. Let us see what other examples of it we may find. The Ontario Archaeological Report[327] of 1924–25 illustrates one found near St. Davids between St. Catherines and Niagara Falls, Canada. Willoughby[328] shows one from a grave near Putnam, Connecticut. M. R. Harrington[329] de-

[327] Ontario Archaeological Report, 1924–25, p. 84.

[328] Willoughby, Charles C., Antiquities of the New England Indians, Peabody Museum (Harvard), p. 199.

[329] Harrington, M. R., A Midcolonial Seneca Site in Erie County, Archeological History of New York, Part 1, N. Y. State Museum Bull., No. 235, pp. 207–237.

scribes several found while excavating the Silverheels site in Erie County, New York. Several rim sherds of this design are pictured by Parker[330] from the Factory Hollow site near West Bloomfield, New York. Both Wren[331] and Beauchamp[332] illustrate several from Honeoye Creek and near West Bloomfield, which probably means the Warren site, from which several examples are in the possession of local collectors in Lima and Honeoye Falls. For Pennsylvania, Cadzow[333] shows this type in all forms, even surmounted by human faces and figures, or with an oval impression in the center of each tooth or petal. All are from the Washington Borough site; the more simple forms are also represented. Certainly so many specimens of this type from so wide a territory cannot mean that the potter was expressing his individuality, but was being motivated to copy some conventional pattern. What was the force back of this change which caused the notched design to become dominant over the older, more prevalent triangular plat type? Further careful excavation may give us the answer.

The second form, with the largest number of examples from Dutch Hollow (Plate 18, Figure 3), is characterized by a very high collar and usually four castellations. Below each castellation is a series of parallel vertical lines extending from the junction of collar and neck to the lip or a line of decoration parallel to it. On both sides of this set of lines are parallel horizontal rows of decoration formed by a line connecting a row of circular impressions. These lines decrease in length from the bottom to the top of the collar. The remaining surface, in the shape of an inverted triangle, is filled with lines parallel to two sides of the triangle and meeting in the center. Numerous examples of this design are found in Pennsylvania where Wren[334] illustrates one from Carbon County, another near Wyoming Valley, and two on the Susquehanna River in Clearfield and Bradford counties. Parker[335] illustrates several sherds of this pattern from the Factory Hollow site, and Cadzow[336] also pictures from the Washington Borough and Shultz sites several examples with but slight variation. No other instances of this type were

[330] Parker, Arthur C., *op. cit.*

[331] Wren, Christopher, A Study of North Appalachian Indian Pottery, Wyoming Historical and Geological Society, 1914, p. 66.

[332] Beauchamp, Rev. W. M., Earthenware of the New York Aborigines, N. Y. State Museum Bull., No. 22, pp. 105–109.

[333] Cadzow, Donald A., Archaeological Studies of the Susquehannock Indians of Pennsylvania, Pub. of Penn. Hist. Commission, Vol. 3, Part 2, pp. 108–114.

[334] Wren, Christopher, *op. cit.*, pp. 49, 62, 66.

[335] Parker, Arthur C., *op. cit.*

[336] Cadzow, Donald A., *op. cit.*, pp. 112–114, 138, 186, 187.

encountered in a perusal of the literature, and it is perhaps possible to assign the influence for this design to the Andaste group of the Iroquois. Perhaps some Susquehannock captives brought the design from their homeland to Dutch Hollow or a neighboring village where it was seen and copied. The only theory that we may safely postulate is that the design appears to be southern in its relationship.

Another characteristic Iroquoian decorative feature found on the Dutch Hollow specimens is the use of the human face. The utilization of this motif at the castellation points has been observed at prehistoric sites throughout the state. In some examples, the face has been done in appliqué, while in others the body of the jar has been squeezed into a projecting knob and the features then incised. Other examples, although none were found at Dutch Hollow, represent the human figure in its entirety, often with the knees bent and projecting from the body of the jar. One, in the possession of a collector in Lima, New York, has four figures, one under each rise in the lip. This came from the Warren site in Ontario County, where it must have been a popular design since Beauchamp[337] illustrates two others, and several highly conventionalized ones are in the collections of local people, all from the same site. Beauchamp lists six more examples, all from eastern central counties and well within the realm of the Mohawk-Onondaga. Cadzow[338] pictures at least three examples of the body design and many more of the face type from the Washington Borough site. From so few reported specimens, it may be imprudent to set forth any theory concerning the age of this design, but from such evidence as is before us, human figure and face coexist on early historic sites, whereas the face alone is depicted on prehistoric sites. Why this change in design? Was it a natural development or a borrowed trait? The cause may be found in the Iroquoian belief that a disembodied spirit, recognizing its features, might enter the effigy of a human figure; presumably, if that figure were on a jar, the spirit might cause the food to spoil. Later came the Jesuit missionary and his crucifix. The Iroquois observed the full figure of Christ on the cross and considered it a potent charm which brought only good luck to the bearer. The potter may then have adopted the full figure in his pottery design and, in some instances, even copied the crucifix figure with its bended knees.

One example of the peculiar U-shaped or double pottery jar was found on the Dutch Hollow site. The collars are decorated by the oblique notched method, but otherwise the vessel is perfectly plain.

[337] Beauchamp, Rev. W. M., *op. cit.*, p. 111.

[338] Cadzow, Donald A., *op. cit.*, pp. 106–113.

Beauchamp[339] illustrates one from West Bloomfield (probably the Warren site) and another from near Wagner's Hollow, Montgomery County. Cadzow[340] depicts three in the Washington Borough report. The Wagner's Hollow and Pennsylvania jars appear to have a large body with two collars, while the Dutch Hollow and West Bloomfield specimens appear as two connected jars. Such a similarity might be expected in two sites so geographically close, although it does not necessarily mean that they were occupied contemporaneously. This form gives us another link with the Susquehanna region.

Another type not encountered on the Dutch Hollow site is the jar with the projecting trough-shaped lip. This might be called the pitcher-lip type, and Parker[341] records a large number of examples from the Ripley site in Erie County. An example exhibiting this characteristic to a slight degree is pictured by Harrington[342] from the Silverheels site. The only other examples from this area are two found in the Ontario Archeology Report for 1919, one of which appears to have a handle under the lip. Parker attributes the Ripley site to the Erie, and as no recorded evidence of lipped jars is found in the state east of this area, it must have been a pottery trait of the Erie or some western people.

Other peculiar forms exist, as flat-bottomed jars, handled jars, and vegetable-shaped bowls. All seem to point toward western influence. The handles found on the Dann site near Honeoye Falls, dating from about 1700, and the flat-bottomed beakers from a transition-period Erie site near Orchard Park, Erie County, excavated by Ritchie, may owe their existence to the influence of the Fort Ancient culture, although no evidence has as yet been found to prove this contact. Griffin's extensive studies of this matter may provide the solution. Dutch Hollow contained one jar with fluted sides resembling a melon or pumpkin. No other known examples of these exist from this area.

In conclusion, the Pan-Iroquoian form with triangular plats existed on all prehistoric sites predominantly, and continued down into early historic times. The notched rim design became dominant during the 17th century and was at its height when pottery was replaced by the less fragile brass kettle. The use of the human figure may have coincided with the arrival of the Jesuit missionaries, although the face had been employed since prehistoric times. The numerous other existing types may be due to the individuality of the potter or the work of captives.

[339] Beauchamp, Rev. W. M., *op. cit.*, pp. 102 and 109.

[340] Cadzow, Donald A., *op. cit.*, p. 113.

[341] Parker, Arthur C., Excavations in an Erie Indian Village and Burial Site at Ripley, Chautauqua Co., N. Y., N. Y. State Bull., No. 117, p. 539.

[342] Harrington, M. T., *op. cit.*, pp. 207–237.

THE HUMAN REMAINS FROM MAMMOTH CAVE, KENTUCKY

GEORG K. NEUMANN[343]

ACKNOWLEDGMENTS

THE WRITER is indebted to Mr. Verne E. Chatelain, Assistant Director of the National Park Service, Branch of Historic Sites and Buildings, and to Mr. Alonzo W. Pond, Archaeologist, for the invitation to make this study. Particular thanks are due to Mr. Pond for his generous permission to use the four photographs that deal with the find of the prehistoric miner, and for much of the archaeological information related to this discovery.

He would also like to express his appreciation to the Mammoth Cave Operating Committee, Mr. W. W. Thompson, General Manager, who extended the invitation and paid the expenses; Mr. M. L. Charlet, Cave Manager, and Mr. Robert P. Holland, National Park Service Representative in Charge, for their many courtesies and kindnesses in facilitating the work.

In addition, the writer wishes to thank Dr. Fay-Cooper Cole, Chairman of the Department of Anthropology of the University of Chicago, who was most generous in his assistance and provision of anthropometric instruments.

INTRODUCTION

The human remains from Mammoth Cave considered in this paper represent two individuals, one a flexed burial taken out by workmen with shovels near the natural entrance in 1930; the other, the recent discovery of the exsiccated body of a prehistoric gypsum miner from the interior of the cave. Although the remains of these two individuals are not the first discoveries of human remains from this cave, they are the first which have ever been described anthropometrically. In a paper on the archaeology of Mammoth Cave,[344] Dr. N. C. Nelson enumerated and discussed the earlier finds. Among the earliest discoveries, between 1810 and 1820, was an exsiccated body, later exhibited as "Fawn Hoof." There exists, however, some doubt as to whether this find was made in Short Cave, Salt's Cave, or Mammoth Cave. Contemporary

[343] University of Michigan, Ann Arbor, Michigan.

[344] Nelson, N. C., Contributions to the Archaeology of Mammoth Cave and Vicinity, Kentucky, Anthropological Papers of the American Museum of Natural History, Vol. 22, pt. 1, New York, 1917.

writings led Nelson to the conclusion that several exsiccated bodies were found in the interiors of caves, that a number of them were burials with artifacts, and that probably all of them were of the same culture. According to the same writer "a considerable amount of skeletal remains" are listed as having been excavated by Professor Putnam (1870–1875), but here again material from Salt's Cave and Mammoth Cave seems to have been mixed, although the artifacts, which are listed, probably again belong to the same culture. Nelson, who carried on his excavations in the vestibule of Mammoth Cave and in a rock shelter near Bone Cave in 1916, found only fragmentary skeletal material in the former, but a complete burial in the latter. His conclusions concerning this burial and the cultural remains from Mammoth Cave will be discussed under the headings below.

I. THE VESTIBULE BURIAL

A. Associated Cultural Material. The burial was discovered in its oval grave, lined with burned grass or fiber matting, and was located, as far as could be ascertained, about thirty feet inside the iron gate at the natural entrance to Mammoth Cave. As Nelson's excavations in the vestibule extended from the entrance slope for about 175 feet back into the cave, "i.e., very close to the iron gate" (p. 47), it is probable that this find belongs to the same aborigines who left the camp refuse which Nelson excavated. No artifacts were associated with the burial. The traits of the culture component are described in Nelson's paper, and need not be listed here again. He concludes that in the vestibule he discovered a culture component which is earlier and more primitive but closely related to the components found in the interiors of the caves of the region. Maize, pottery, artifacts of the strictly polished types, and copper were lacking.

B. State of Preservation. The state of preservation of the bone was excellent, but due to the method of removal, there was considerable breakage and loss of small bones and fragments. The nasals; the right zygomatic; the basilar part, the right half of the squamous part, and the condyles of the occipital; the posterior half of the right temporal; the posterior half of the right parietal; and most of the sphenoid bone were missing. Enough of the occipital was left, however, so that a line could be drawn along the median sagittal plane, and enough points of contact were found between different fragments to permit reconstruction and to allow many measurements to be taken.

C. Age. As the skeleton of this individual was fairly complete, the age at time of death could be ascertained quite closely. Both pubic bones

FIG. 1.—Skull of the young female in the *norma lateralis*.

FIG. 2.—The same, in the *norma frontalis*.

FIG. 3.—The body of the prehistoric minor *in situ*. The lower end of the limestone block rests on the skull, neck, and thorax. Photograph by Alonzo W. Pond.

Side, top, and face view of the head of the prehistoric miner. Photographs by Alonzo W. Pond.

were preserved, and the symphysial surfaces exhibit a typical first stage,[345] indicating an age of eighteen to nineteen years. Of the epiphyses, the distal radius, proximal humerus, and crest of ilium show recent closure; the distal femur, proximal tibia, and proximal fibula show complete closure; indicating a mean age of 18.4 years. Eruption and occlusion of the third molars, and the fact that all endocranial sutures are patent corroborate this age.

D. Sex. The sex characters of the skull and pelvis, and slight build of the individual are typically female.

E. Measurements and Indices. The letter given with the name of the character in the tables is the usual biometric notation;[346] the number refers to the definition given in the second edition of Martin's *Lehrbuch*.[347]

As the cranial capacity could not be taken directly, Lee and Pearson's regression formula:[348] Capacity = 206.6 + 0.000400 (L × B × OH) was used to compute it. The result for the skull is 1081 ccm. If Pearson's interracial formula for the female skull: Capacity = 296.40 + 0.000375 (L × B × OH), is used, the result is somewhat higher, 1116.2 ccm., and probably more nearly correct. At any rate, the skull is quite small, an observation that has been reported a number of times for Palaeo-Amerind skulls. In relation to the length, the brain case is high, the value of the length-ear-height index being 63.63, or hypsicranial. Absolute dimensions are all small. The cranial index is 75.75, mesocranial on the border of being dolichocranial, but these classes, it must be kept in mind, are rather arbitrary. The transverse frontal and the transverse fronto-parietal indices express the minimum frontal breadth in terms of the maximum frontal breadth, and minimum frontal breadth in terms of the maximum breadth of the brain case, respectively. The occipital index that is usually taken by the biometricians is:[349]

$$100\frac{S_3}{S_3'}\sqrt{\frac{S_3}{24(S_3-S_3')}}.$$

[345] Todd, T. W., Age Changes in the Public Bone, III, The Pubis of the White Female, American Journal of Physical Anthropology, Vol. 4, No. 1, pp. 26–40, January–March, 1921.

[346] Morant, G. M., A Preliminary Classification of European Races Based on Cranial Measurements, Biometrika, Vol. 20B, pp. 362–364, 1928.

[347] Martin, R., Lehrbuch der Anthropologie. Second edition, Jena: Gustav Fischer, Vol. 2, 1928.

[348] Cited in Martin, *id.*, p. 647.

[349] Biometrika, Vol. 13, p. 261.

With the exception of the right zygomatic bone, the nasals, and a small portion of the interorbital region, the bones of the face were all present. Reconstruction of the zygomatic bone was possible as the zygomatic process of the right temporal bone was in place. As the greatest width across the zygomatic arches usually is found on this process, the bizygomatic breadth was taken there. Enough of the *pars nasalis* of the frontal and the *processus frontalis* of the left maxilla remained to indicate where the medial margin of the orbit and the measuring point maxillo-frontale should be on the left side. The three facial indices express the length of the face, which is hyperleptoprosopic (total facial index of 100.00), leptēn (superior facial index of Kollmann, 56.89), and leptoprosopic (superior facial index of Virchow, 73.33), according to the various indices. The orbits are mesoconch, or medium in proportions, with an index of 76.92; and the nose, chamaerrhine, or broad, with an index of 54.34. The palate is complete. It is broad, with a maxillo-alveolar index, which gives the external proportions of 121.15, brachyuranic; and a palatal index of 84.09, mesostaphyline on the border of being brachystaphyline.

In order to show cranio-facial relationships, three indices were taken: the transverse cranio-facial, which indicates in this instance that the bizygomatic breadth is 92.80 per cent of the maximum breadth of the brain case; the zygomatico-frontal index, the value for which in this skull is 72.41, i.e., that the minimum frontal breadth is 72.41 per cent of the bizygomatic breadth; and the jugo-manibular index, which in this case shows that the greatest width of the mandible at the angles is 73.27 per cent of the bizygomatic breadth.

There is a medium amount of prognathism (facial profile angle of 83.5°, mesognathous; nasal profile angle of 88.0°, orthognathous; alveolar profile angle of 72.5°, prognathous), although, as can readily be seen from the three angles, it is mainly due to alveolar prognathism.

F. Observations. (1) Occipital. The external occipital protuberance is absent, and the *liniae nuchae superiores* and *supremae*, as may be expected, are not well developed. There is a medium amount of bombing of the occipital bone, as may be seen in the photograph of the *norma lateralis* of the skull.

(2) Parietals. The parietal eminences are medium in development, and there is a slight amount of cresting in the region of the median sagittal plane. This, with the nearly parallel side walls, gives a rounded-off pentagonal shape to the skull when seen from the *norma occipitalis*. There isn't any evidence of a *depressio praelambdoidea*, nor of a post-bregmatic depression.

TABLE I

No.	Biom. notation	Character	mm.
		Brain Case	
1	L	Glabella-opisthocranion	165
1b	F	Flower's ophryon-opisthocranion length	164
2		Glabella-inion	162
3		Glabella-lambda	160
8	B	Maximum breadth	125
9	B′	Minimum frontal breadth	84
10	B″	Maximum frontal breadth	103
20		Porion-bregma projected height	105
21	OH	Ear height	108
23	GlU	Horizontal circumference over glabella	470 (?)
23a	U	Horizontal circumference over ophyron	464 (?)
24	βQ′	Vertical arc over bregma	291
24b	Q′	Vertical arc over vertex	295
25	S	Sagittal arc	335
26	S_1	Frontal arc	114
27	S_2	Parietal arc	114
28	S_3	Occipital arc	107
29	S_1'	Frontal chord	102
30	S_2'	Parietal chord	102
31	S_3'	Occipital chord	93
		Face	
45	J	Bizygomatic breadth	116
46	GB	Medial facial breadth	90
47		Facial height, nasion-gnathion	116
48	G′H	Upper facial height, nasion-alveolar point	66
50		Anterior interorbital breadth	20
51	O_1	Orbital breadth, left	39
52	O_2	Orbital height, left	30
54	NB	Nasal breadth	25
55	NH′	Nasal height	46
60		Maxillo-alveolar length	52
61		Maxillo-alveolar breadth	63
62	G_1'	Palatal length	44
63	G_2	Palatal breadth	37
		Mandible	
	w_2	Greatest width of mandible at angles	85
	h_1	Gnathion-intradental	38
69	g_nd_I	Gnathion-infradental	35
70		Gonion to top of capitulum mandibulae, rt.	53
71	rb′	Least breadth of ramus in any direction, rt.	36

TABLE II

No.	Biom. notation	Indices and Angles	
(8)100/ (1)	100 B/L	Cranial index	75.75
(20)100/ (1)		Length ear-height index	63.63
(9)100/(10)		Transverse frontal index	81.55
(9)100/ (8)		Transverse fronto-parietal index	67.20
	Oc. I.	Occipital index	64.88
(47)100/(45)		Total facial index	100.00
(48)100/(45)		Sup. facial index (Kollmann)	56.89
(48)100/(46)	100 G'H/GB	Sup. facial index (Virchow)	73.33
(52)100/(51)	100 O_2/O_1	Orbital index, left	76.92
(54)100/(55)	100 NB/NH'	Nasal index	54.34
(61)100/(60)		Maxillo-alveolar index	121:15
(63)100/(62)	100 G_2/G_1	Palatal index	84.09
(71)100/(70)		Index of ramus of mandible	67.92
(45)100/ (8)		Transverse cranio-facial index	92.80
(9)100/(45)		Zygomatico-frontal index	72.41
(66)100/(45)		Jugo-mandibular index	73.27
72		Facial profile angle	83.5°
73		Nasal profile angle	88.0°
74		Alveolar profile angle	72.5°
79		Mandibular angle	124.5°

(3) Frontal. The supraorbital ridges, of the type in which the *arcus superciliaris* does not come down to the *margo supraorbitalis*, are nearly lacking. The supraorbital margins are sharp, the glabella slightly developed (II on Broca's scale, modified and reproduced by Martin, p. 873), and the fronto-nasal junction plain. In the slightly retreating forehead the frontal eminences are hardly distinguishable.

(4) Temporals. *Crista supramastoidea* (left) thorn-shaped, *porus acusticus externus* oval, mastoid process sub-medium.

(5) Maxillae. The palate is paraboloid in shape.

(6) Nasals and piriform aperture. The nasal bones are missing; the lower margin of the *apertura piriformis* shows the *sulcus praenasalis* on each side; the *spina nasalis anterior* is small (2 on Broca's scale, reproduced by Martin, p. 948); the nasion region lies rather high.

(7) Zygomatic bones. Angularity and anterior flattening absent.

(8) Orbita. Axes show a slight amount of declination.

(9) Mandible. The mandible is not especially heavy and the chin is medium in development; the *tubercula mentalia* are medium in size; and the jaw prominence is medium to sub-medium.

(10) Teeth. There are five cusps on each of the lower second molars.

The following teeth were lost at the time of excavation of the burial: upper right incisors, cuspid, first and second bicuspids, and third molar; upper left central incisor, and cuspid; lower left lateral incisor, second bicuspid, and third molar.

G. Conclusions on the Vestibule Burial. The burial discovered in 1930 probably belongs to the same group of Amerinds who left the camp refuse in the vestibule of Mammoth Cave. In 1916 Nelson excavated portions of the floor of the vestibule and subsequently described the cultural remains, which seem to belong to a phase of the Woodland Pattern, and may antedate the material found in the interior of the cave. The individual represents a young female of slight build with a small, high, and long skull, a narrow face, orbits of medium proportions, a broad nose, and some alveolar prognathism, a member of a physical type that has not yet been encountered in other excavations in Kentucky. The dolicho- and mesocranial skulls from the ossuaries and crematory pits of the Page Site in Logan county,[350] which, according to Webb and Funkhouser, are typical of their group, are rather close in cranial index, but differ in all other respects. As far as the measurements and indices of one skull can be compared to the means of measurements and indices of skulls of another group, the skull perhaps comes closest to Hooton's Basket Maker type from Pecos Pueblo, and the crania from the caves of Coahuila, Mexico.[351] For both series, however, only measurements and indices for males are given, which prohibits a direct comparison of absolute measurements. Under those circumstances the best comparison can be made by placing the mean indices of these two series beside the indices of the skull that is described here.

Index	Mammoth Cave	Pecos "B-M"	Coahuila caves
Cranial index	75.75	76.38	74.35
Length-height index	high	76.86	73.24
Total facial index	100.00	90.20	91.67
Superior facial index	56.89	55.00	55.54
Orbital index	76.92	90.43	86.07
Nasal index	54.34	50.75	50.07
Maxillo-alveolar index	121.15	122.00	120.29

[350] Webb, W. S. and W. D. Funkhouser, The Page Site in Logan County, Kentucky. The University of Kentucky Reports in Archaeology and Anthropology, Vol. 1, No. 3, Lexington: The University of Kentucky, 1930.

[351] Hooton, E. A., The Indians of Pecos Pueblo. Pp. 231–247, New Haven: The Yale University Press, 1930.

The skull resembles those of the two series in that they are all on the border of being dolichocranial, all are leptoprosopic, leptene, and brachyuranic, and both the skull and the Pecos "Basket Makers" are hypsicranial. The greatest difference is in the orbital index and in the nasal index. In the former the skull from the vestibule of Mammoth Cave is mesoconch, while the mean indices of the two other series are hypsiconch; in the latter it is chamaerrhine, while the means of the other two series are mesorrhine (Plate 19).

II. PREHISTORIC MINER

The exsiccated body of a prehistoric miner was discovered on June 7, 1935, by Grover Campbell and Lyman Cutliff, two Mammoth Cave guides, working with a Civilian Conservation Corps crew in building trails. The find was not disturbed, and Mr. M. L. Charlet, Cave Manager for the State, and Mr. R. P. Holland, representative of the National Park Service, were notified. Later Mr. Alonzo W. Pond, an archaeologist of the National Park Service, arrived to supervise the excavation. The writer was called to Mammoth Cave to examine the find in order to describe its physical characteristics.

A. Circumstances of the Find. The find was located on a narrow ledge about twenty feet above the floor of the cave, some seventy feet south of a room called Waldach Dome, an enlargement of the main avenue of the cave, approximately a mile and a half from the natural entrance, and about half a mile from the artificial entrance known as the Violet City Entrance. The aboriginal occupation is confined to the first and second levels of the cave, and is still evident everywhere despite the fact that people have gone through it for at least 126 years. Burned reeds, the remains of reed torches, some tied with grass cord, are strewn among the rocks, and pecking marks on the walls where aboriginal man removed the gypsum can be seen wherever one looks. The ledge is from about four to twelve feet wide and covered with limestone blocks which originally came from the roof, and loose sand which slopes steeply towards the edge. The prehistoric miner had dug under one of these large blocks of limestone, estimated to weigh around five tons, and had succeeded in removing the gypsum from a fourth of the under surface of this rock when it slipped from the smaller blocks that served as supports, and pinned him under it. He was probably thrown from a kneeling position on his right side landing on his elbow, the distal end of the humerus snapping off immediately above the capitulum and being left behind with the forearm as the shaft of the humerus was

forced into the sand. The forearm still attached by muscles and ligaments, dropped back at right angles over the stump of the upper arm. The end of the stone came to rest on the back of the neck and chest, on the crest of the left ilium, and on the skull posterior to the left mastoid process, crushing in that part of the skull, and pushing his face into the sand. The force of the impact half doubled the chest over on his pelvis, breaking the right tenth, eleventh, and twelfth ribs about one and a half inches from their articulation points with the vertebrae. It is only due to the presence of smaller fragments of limestone around him that his body wasn't entirely crushed. The legs were flexed and free, with the right knee higher than the head, and the left pressed against a smaller rock which was buried in the loose sand; the left arm was bent across the left leg. Finally sand slid or filtered in around the body leaving only the back of the head, neck, shoulder, parts of the right arm, and the left forearm exposed.

B. Associated Cultural Material. Since a detailed description of the archaeological finds and a comparison with similar material from other parts of Kentucky is to be prepared later by Mr. Pond, the associated cultural material will merely be listed below. Textile material, evidently some sort of blanket or robe of open twined weave, was tied with a braided cord around the body, and a polished, undecorated mussel-shell pendant was suspended from the neck by a piece of two-strand twisted cord. These were the only things directly associated with the find. Crude limestone pecking hammers, bundles of reeds tied with grass, sticks, parts of gourds, woven fiber moccasins, twisted cord, braided strands of grass, a fragment of bagging, a stout pole which probably was used as a ladder, some hickory nuts, and human excrement are the only other material discovered in the immediate neighborhood in the cave. All this material checks rather closely with that listed by Nelson[352] for other parts of the interior of Mammoth Cave and also other caves in the surrounding country. He comes to the conclusion that the material from the interior of the cave, the accumulation of a whole century of collecting activity, is identical in nature with the material from the relatively modern, though prehistoric stone graves.[353]

C. Antiquity of the Find. In describing the circumstances of the find, mention was made of aboriginal pecking marks on the walls of the cave. There is a direct correlation in the distribution of these marks on

[352] Nelson, *op. cit.*, pp. 23–39.
[353] *Ibid.*, p. 70.

the walls where the gypsum has been removed, and the distribution of burnt reeds which were used by the aborigines as torches. Secondary formation of gypsum in areas where it was removed and in the center of the pecked areas attests to their antiquity. A date, 1847, and signature, recently discovered in the Black Chamber of Mammoth Cave, show only a fraction of the formation when compared to some of the gypsum in pecking marks a few feet away. Dr. E. R. Pohl, geologist of the National Park Service, in an unpublished manuscript, *The Formation of Gypsum in Limestone Caverns*, believes this to be a clue for dating the aboriginal occupation, although like the formation of onyx, the rate of formation of gypsum probably varies immensely with fluctuations in ground water and other hydrologic and physiographic circumstances. Assigning a date, therefore, even within broad limits, Dr. Pohl feels, at present would be premature. Roughly it would indicate an age in a vicinity of 500 years, but the studies have not been completed, and under no circumstances can the data be used by itself as conclusive evidence.

Little information can be obtained from tree ring specimens, cores from the pole "ladders" found in the interior of the cave, as they do not contain enough rings to fit them into the master chart for the region.

Direct stratigraphical evidence is lacking, and Nelson's placing the vestibule material as earlier and more primitive though closely related to the material in the interior of the cave is based on typological differentiation. Since the material from the rock shelter excavated by Nelson and the cave interiors was found to be the same, and the material from both is identical with the remains reported from the stone graves found in the same region, he reached the conclusion that in all probability this cultural component is relatively modern, though before European contact. This would substantiate the estimate based on the formation of gypsum.

D. State of Preservation. The body is in a good state of preservation, except where rodents have disturbed it. The left hand, including the carpal region, was missing; a number of the phalanges were found, however, in the sand under the face. The distal ends of the exposed left radius and ulna show breakage, the cancellous bone showing around the edges. The right forearm was gnawed off about four inches from the proximal end of the elbow, and tooth marks can be seen on both radius and ulna; nothing was found of the part gnawed off. There is also an opening into the thoracic cavity where rodents have made a hole through the skin and muscles between the ninth and tenth right ribs,

and some gnawing on the vertebral margin and spine of the right scapula.

The body is exsiccated; the skin is quite hard, but other soft tissues like the muscles, are extremely fragile. The exsiccation is noteworthy as the air is quite moist (humidity of 85%) in that part of the cave according to tests that were carried on by Mr. Pond. He suggests that the scarceness of bacterial life, and possibly the presence of some chemical in the sand may be the factors responsible for the condition.

E. Age. The individual was probably about forty-five years old at the time of death. This estimate is, however, more or less of an approximation as neither endocranial suture closure nor age changes of the pubic symphysis could be used; examination of the interior of the brain case, and removal of the symphysial surface of one of the pubic bones was out of the question as the body is to be preserved as an exhibit. It was, however, possible to examine some of the sutures externally: the *pars pterica* of the coronal suture showed complete closure, while the parieto-mastoid culture was still patent, a condition which might indicate an age of 41–51 years.[354] Nearly all of the teeth showed fourth degree attrition, and indicate an age comparable to the above.

F. Sex. Male. There was little difficulty encountered in determining the sex of the individual, as the external genitalia were preserved. The secondary sexual characters of the skull were well marked.

G. Stature. As the doubled-up position of the body prohibited the measuring of the height of the individual as a whole, it was found necessary to compute the stature from measurements of individual bones of the upper and lower extremities. Enough of the skin and other tissues were temporarily removed from the ends of the long bones at the measuring points to determine their lengths. Of course, the femora had to be excluded as the articulation with the *ossa innominata* and tibiae made measuring of the total length of these bones impossible; and the right upper extremity had to be omitted because of breakage. The stature of the individual was then found by using the length measurements on Manouvrier's tables cited by Martin.[355] This formula gave a cadaver stature of 1633 mm. from the average of the lengths of all the bones, or a stature of 1613 mm., or 5 feet 3½ inches, for the stature of the individual when he was alive.

[354] Todd, T. W. and D. W. Lyon, Jr., Endocranial Suture Closure, Its Progress and Age Relationship, Part 1, Adult Males of White Stock, American Journal of Physical Anthropology, Vol. 7, No. 3, pp. 325–384, 1924.

[355] Martin, *op. cit.*, Vol. 2, pp. 1068–1071.

H. Measurements and Indices. Due to the preservation of the soft tissues of the head, the number of measurements that could be taken were quite limited. Those listed in tables III and IV represent skeletal

TABLE III

No.	Biom. notation	Character	mm.
		Brain Case	
1	L	Glabella-opisthocranion	182
8	B	Maximum breadth	146
9	B′	Minimum frontal breadth	95
		Face	
45	J	Bizygomatic breadth	153
47		Facial height, nasion-gnathion	127 (?)
48	G′H	Upper facial height, nasion-alveolar point	77.5
51	O_1	Orbital breadth, right	44
52	O_2	Orbital height, right	32
54	NB	Nasal breadth	24
55	NH′	Nasal height	57
	SS	Simotic subtense	4
		Mandible	
	w_2	Greatest width of mandible at angles	117

TABLE IV

No.	Biom. notation	*Indices*	
(8)100/ (1)	100 B/L	Cranial index	80.22
(9)100/ (8)		Transverse fronto-parietal index	65.07
(47)100/(45)		Total facial index	81.70
(48)100/(45)		Superior facial index (Kollmann)	50.65
(52)100/(51)	100 O_2/O_1	Orbital index, right	72.72
(54)100/(55)	100 NB/NH′	Nasal index	42.48
(45)100/ (8)		Transverse cranio-facial index	104.79
(9)100/(45)		Zygomatico-frontal index	62.09
(66)100/(45)		Jugo-mandibular index	76.47

measurements, small areas of the soft tissues having been temporarily removed at the measuring points. The numbers and notations are the same as those that appear in tables I and II. Measurement no. 47, total facial height (nasion to gnathion), is an approximation. It was

found by adding the distance from nasion to the lower edge of the upper central incisors to the distance from the upper edge of the lower central incisors to gnathion, and making a small allowance for alveolar prognathism.

The braincase is slightly asymmetrical (see top view of head, Plate 20), and, as a whole, intermediate in its absolute dimensions. It can be described as high and round (brachycranial, with a cranial index of 80.22), with a forehead narrow in breadth in relation to the width of the braincase (transverse fronto-parietal index of 65.07, stenometopic), and very narrow in relation to the bizygomatic width (zygomatico-frontal index, 62.09). The face is broad in its absolute dimensions (bizygomatic breadth: 153, and greatest width of mandible at the angles: 117), as well as in its relation to the height of the face (total facial index: 81.70, euryprosopic; superior facial index: 50.65, mesene); the orbits are low (chamaeconch: 72.72); and the nasal proportions are narrow (leptorrhine: 42.48). Facial prognathism is slight.

I. Observations. (1) Occipital. The external occipital protuberance, as in most male American Indians, is only slightly developed (perhaps 1 in Broca's scale, reproduced by Martin, p. 843). The bombing of the occipital bone is slight as may be seen from the photograph of the *norma lateralis* of the head (Plate 20).

(2) Parietals. The parietal eminences are medium in development, and the braincase is wider across the temporals than across the parietals.

(3) Frontal. The supra-orbital ridges, which are of the type in which the *arcus superciliaris* forms part of the *margo supraorbitalis*, are sub-medium to medium in development. The supra-orbital margins are blunt, the glabella is medium high (III, on Broca's scale, modified and reproduced by Martin, p. 873), and the fronto-nasal junction is beetling. The forehead is slightly retreating, and the *tubera frontali* are medium in development.

(4) Temporals. The *squamae* are quite full. The mastoid processes are large.

(5) Maxillae. The palate is paraboloid in form, with the anterior region somewhat flattened; it is very high and broad.

(6) Nasals and piriform aperture. In sagittal section the nasal bones are concavo-convex, with the saddle of the bridge much below nasion. The root of the nose is high, the nasion depression medium. The lower nasal margins exhibit the sharp anthropine form, the anterior nasal spine is medium in size (3 in Broca's scale, given in Martin, p. 948). The *apertura piriformis* is piriform.

(7) Zygomatic bones. The zygomatic bones exhibit a considerable amount of lateral projection and anterior flattening.

(8) Orbita. The orbits are long, low, and somewhat angular.

(9) Mandible. The mandible is rather heavy, with the chin region somewhat retreating. The chin region is square rather than pointed; the chin eminence and mental tubercles are medium in development.

(10) Teeth. Nearly all teeth exhibit fourth degree attrition; they are too worn to determine whether the incisors were shovel-shaped.

J. Conclusions on the Prehistoric Miner. It was pointed out in the section dealing with the antiquity of the find that Nelson considers the cultural material from the interior of the cave to be the same as that from the rock shelter that he excavated near Bone Cave, and the material from both to be similar to that found in the stone graves of this region. This cultural manifestation, with its stone graves for flexed burials and grit tempered pottery, is not to be confused with that of the Middle Mississippi foci of the Tennessee-Cumberland region, with the stone graves for extended burials and shell tempered pottery. In all probability both types of components, those from the interiors of caves, including the find of the Prehistoric Miner, and the component from the vestibule of Mammoth Cave, represent manifestations of a phase of the Woodland Pattern. Pottery was lacking from the component from the vestibule of Mammoth Cave and from the material with the Prehistoric Miner. Whether or not the absence of pottery from the material associated with the latter find indicates that the individual belonged to a non-pottery making group remains an open question. However, all artifacts found with or near the Prehistoric Miner are similar to those found in the interiors of caves in this vicinity.

Regarding the antiquity of the components, Nelson believes that from the vestibule to be earlier than that from the interiors of caves, and that the latter material is not more than three or four hundred years old.[356] This estimate was substantiated by the rough estimate from the formation of gypsum.

A corroboration of the conclusion that the Prehistoric Miner belonged to the same group of people responsible for the stone graves lies in the fact that the skull of the female that Nelson excavated from a stone grave in the rock shelter near Bone Cave is, like the Prehistoric Miner, near the border between meso- and brachycrany. The cranial index for the female is 79.29. However, it would be desirable to take

[356] Nelson, *op. cit.*, pp. 39, 44.

additional measurements on that skull before drawing definite conclusions from this.

The Prehistoric Miner represents a middle-aged male of small stature, with a high, round skull, a broad face with projecting malars, low orbits, and a narrow nose; a physical type that is clearly Mongoloid, probably representing a second wave of migrants to the New World.

If one can draw any conclusions from two skulls, they may tell the story of a replacement of one physical type by another, a Palaeo-Amerind by a Neo-Amerind type, without a great change in culture. This is of interest because the replacement of dolichocranial types by brachycranial types has been demonstrated for many parts of the New World. Some years ago, Dixon[357] discussed the evidence, listing the instances where this change is substantiated by stratigraphic data, and pointing out the marginal distribution of the dolichocranial types. More recently similar replacements have been reported from the Fisher site in Illinois;[358] from the Page site in Logan County, Kentucky;[359] and from Fulton County, Illinois.[360] In the Southwest the brachycranial types first appear occasionally in late Basket Maker III sites,[361] and more regularly in the Pueblo I period, which dates from approximately 800 to 900 A.D.[362]

---

[357] Dixon, R. B., The Racial History of Man. New York and London: Charles Scribner's Sons, p. 420 *et seq.*, 1923.

[358] Langford, G., The Fisher Mound Group, Successive Aboriginal Occupations near the Mouth of the Iroquois River, American Anthropologist, N. S., Vol. 29, p. 153x, 1927.

[359] Webb and Funkhouser, *op. cit.*

[360] Neumann, G. K., Preliminary Notes on the Crania from Fulton County, Illinois (In: Cole, F.-C. and T. Deuel, Rediscovering Illinois). Chicago: University of Chicago Press, 1937.

[361] Roberts, Frank H. H. Jr., A Survey of Southwestern Archaeology, American Anthropologist, N. S., Vol. 37, No. 1, p. 9, 1935.

[362] *Ibid.*, p. 25.

CORRESPONDENCE

For Identification

These pieces (Fig. 21) are made of a poorly puddled crumbly ware that contains considerable coarse grit tempering. They were apparently heavily fired, because the external surfaces are hard and are difficult to scratch with the thumb nail, while on the broken surfaces fairly large granules can be broken out by moderate pressure of the ball of the thumb. There are nine fragmentary specimens on hand, the outer surfaces of seven showing a coarse cord imprinting, and the outer surfaces of two a rather fine cord imprinting. All nine are from within the Cahokia Mound Group.

There are two types represented and they have several features in common. Both somewhat resemble a tree stump with a flaring top and with two foot-like projections suggesting the above-ground portions of the larger roots. These two foot-like projections are placed almost at right angles to each other so that about three-fourths of the base is roughly circular in outline. Neither of the two more complete specimens have both of the feet; but were both feet present, it is thought that the object would stand in the upright position without additional support. Each type has a deep inverted conical cavity, the base of the cone being at the top and the apex extending down into the body for a distance equal to one-half or two-thirds of the entire height of the object.

The difference in the two types is in a hole in the lower portion of the pieces. In the first type (Figure 21, a–b) the hole is a perpendicular downward extension of the apex of the conical cavity. It emerges on the bottom of the piece in a circular opening five-eighths inch in diameter. In the second type (Figure 12, c–d) the hole lies in the horizontal plane about one inch above the bottom of the piece, and has no connections whatever with the conical cavity above. The hole begins in the angle between the two feet, extends straight through the base, and emerges on the opposite side. This specimen is five and one-fourth inches high, and the diameter across the rim is three and three-fourths inches. The rim varies from five-eighths to three-fourths of an inch in thickness, and the hole is three-eighths inch in diameter.

Two specimens of each type can be identified, and the other five fragments are represented by three foot specimens, and two body specimens insufficient for typing. Five other fragmentary specimens have been seen. Four are from the southern portion of, or just south of the Cahokia Mound Group proper, and the fifth was found at a village site in the summer of 1937 in the Pierre Marquette State Park, Jersey County, Illinois, by Mr. John Rinaldo of the University of Chicago.

Any information relative to the identification of these objects will be appreciated.

P. F. Titterington
212 Metropolitan Bldg.
St. Louis, Mo.

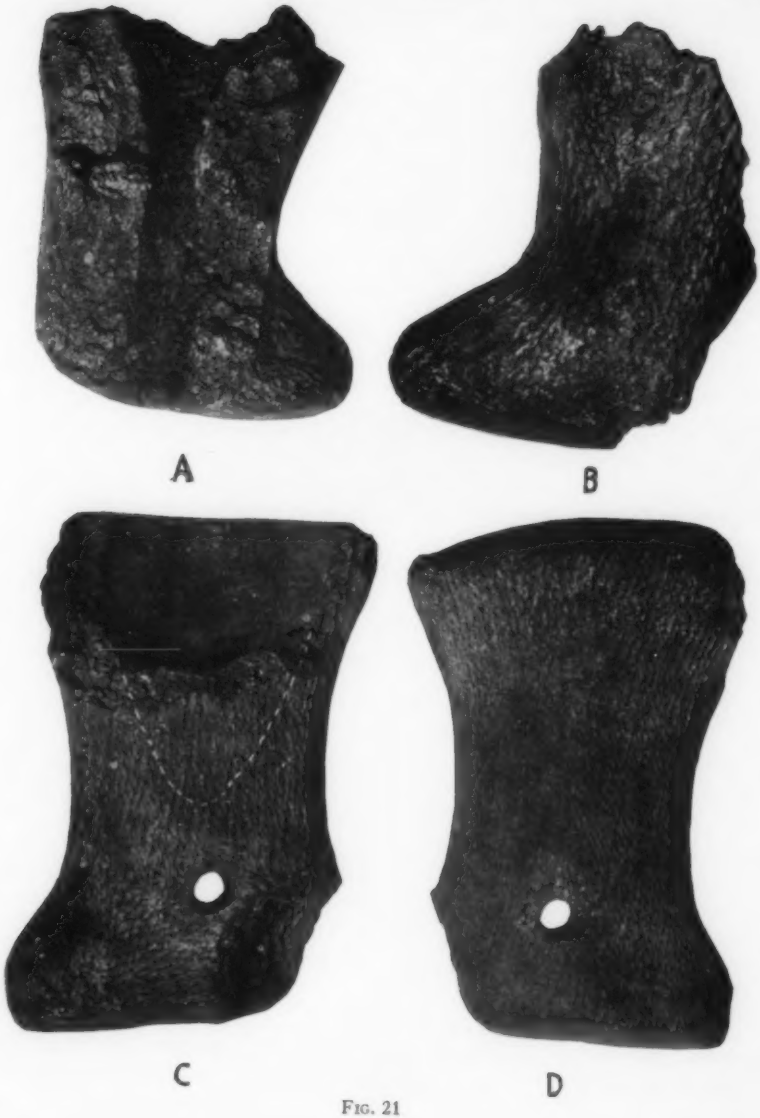


FIG. 21

Historic Use of the Spear-Thrower in Southeastern North America

As is well known, specimens of the atlatl or spear-thrower have been recovered from archaeological deposits in Florida, Arkansas, and other sections of the Southeast, and in American Antiquity (July, 1937, pp. 51–52) Baker and Kidder report upon and figure a spear-thrower obtained from a cave on the Cimarron River, Oklahoma, which is, to be sure, somewhat beyond the proper boundaries of the Southeast.

The situations in which many of these have been found have led to the suspicion that their use was not abandoned until comparatively late prehistoric times, but I was unaware that any record had been preserved of their actual use by any of the tribes found in occupancy until I happened upon the following notice. This is contained in Garcilaso de la Vega's great work entitled *La Florida*, describing the North American expedition of Hernando de Soto. It was originally published at Lisbon in 1605, but a second edition appeared at Madrid in 1723. It is from the latter that the subjoined Spanish text describing this weapon has been taken. The two editions are practically identical.

This notice seems to have escaped the attention of ethnologists mainly because there has never been a complete translation of the work into any language, and the original text is lengthy and rather tedious. Moreover, the note in question appears near the end of the relation, in connection with the last encounter between the surviving Spaniards and the Indians. This took place at the very mouth of the Mississippi River, in territory held, when next we come to know it, at the end of the seventeenth century, by two little tribes called Washa (Ouacha) and Chawasha (Chaouacha), related to the Chitimacha. Whether the same people were in occupancy in 1543 we have no means of knowing.

As Garcilaso's mother belonged to the imperial family of Peru and lived there until he was twenty-three, he was perfectly familiar with Peruvian weapons, the spear-thrower among them, and as a considerable number of De Soto's men were veterans of the Peruvian conquest, there can be no mistake regarding the identity of the implement in question, though most of the description applies to the Peruvian weapon rather than that observed in North America. Garcilaso had a good story-teller's instinct for striking incidents that might appeal to his readers, and it is always necessary to be on one's guard when studying his work. In the present instance, however, I see no special reason why he should have chosen to embellish his narrative by referring to an implement which can have been known to few of his readers. Garcilaso's errors are rather quantitative than qualitative, and I have repeatedly found that his notes on Indian manners and customs are well founded though sometimes distorted.

An abbreviation of Garcilaso's work was made and published in French by Pierre Richelet in 1670, and this was translated into English by Barnard Shipp

and printed in Philadelphia in 1881. Unfortunately the nature of the weapon in question is entirely obscured in this translation.

The Fidalgo of Elvas describes the encounter with these Indians but says nothing regarding an atlatl.

Spanish Text

"Vn Español salió herido de vna arma, que los Castellanos llaman en Indias Tiradera, que mas propriamente la llamarémos bohordo, porque se tira con amiento de palo, ó de cuerda. La qual Arma no avian visto nuestros Españoles en todo lo que por la Florida, hasta aquel dia, avian andado. En el Perú la vsan mucho los Indios: es vna arma de vna braça en largo de vn junco maciço, aunque foso por de dentro, de que tambien hacen flechas. Echanles por casquillos puntas de cuernas de Venado, labradas en toda perfeccion, de quatro esquinas, ó harpones de madera de palms, ó de otros palos, que los ay fuertes, y pesados como hierro; y para que el junco de la flecha, ó bohordo, al dar del golpe, no hienda con el harpon, le echan vn trancahilo, por donde recibe el casquillo, ó harpon, y otro por el otro cabo, que los Ballesteros en los virotes llaman Batalla, donde reciben la cuerda del arco, ó el amiento, con que lo tiran. El Amiento es de palo, de dos tercias en largo, con el qual tiran el bohordo con grandissima pujança, que se ha visto pasar vn hombre armado con vna cota. Esta Arma fue en el Perú la mas temida de los Españoles, que otra qualquera que los Indios tuviesen: porque las flechas no fueron tan bravas como las de la Florida.

"El Bohordo, ó Tiradera, con que hirieron á nuestro Español, de quien ibamos hablando, tenia tres harpones, en lugar de vno, como los tres dedos mas largos de la mano: el harpon de en medio era vna quarta mas largo, que los de los lados, y assi pasó el muslo de vna vanda á otra, y los colaterales, quedaron clavados en medio dél, y para sacarlos forçosamente fue menester hacer gran carnicera en el muslo del pobre Español, porque eran harpones, y no puntas lisas; y de tal manera fue la carniceria, que antes que le curasen espiró, no sabiendo el triste de quien mas se quejar, si del enemigo que le avia herido, ó de los amigos, que le avian apresurado la muerte" (pp. 249–250).

Translation

"One Spaniard was wounded by a weapon that the Castilians in the Indies call a *tiradera* (javelin), which we shall call more accurately a *bohordo* because it is shot with a stock (*amiento*) of wood or a cord. The Spaniards had not seen this weapon in all the places they had visited in Florida until that day. In Peru the Indians use it a great deal. It is a weapon a fathom long made of a firm rush, though spongy in the center, of which they also make arrows. They make heads for them of deer horn, fashioned in all perfection with four points or harpoons of palm or other wood that they have, as strong and heavy as iron. So that the part of the arrow or dart made of the rush will not be split by the barb when it hits its mark, they make a knot where the head or harpoon joins

it, and another one at the other end, which the cross-bowmen call *batalla* on their darts, where it receives the cord of the bow or the stock with which they shoot it. The stock is of wood two *tercias* long, and they shoot the dart with it with extreme force, so that it has been known to pass through a man armed with a coat of mail. The Spaniards in Peru feared this weapon more than any other the Indians had, for their arrows were not so terrible as those of Florida.

"The dart or long arrow with which they wounded our Spaniard of whom we were speaking had three barbs in the place of one, similar to the three largest fingers of the hand. The barb in the center was a hand-breadth longer than the two on the sides, and thus it went through the thigh from one side to the other. The two side barbs were lodged in the middle of the thigh and in order to get them out it was necessary to cut away a great deal of flesh from the poor Spaniard's leg, because they were harpoons and not smooth points. The butchery was such that he expired before they got his wound dressed, the poor fellow not knowing whether to complain more of the enemy who had wounded him or of the friends who had hastened his death."

JOHN R. SWANTON
Bureau of American Ethnology
Washington, D. C.

ANTIQUITY OF THE BOW

A question that has never been satisfactorily cleared up, and probably never will, is that of which was the first in use on this continent, the bow or the atlatl. To me this important subject has not been given the proper attention and thorough investigation that it warrants, and this, I believe, is due to the fact that the majority of archaeologists are too ready to accept the word of a few prominent men, and give the subject little or no study themselves. Atlatls have been found in Basket Maker caves, and because of lack of evidence of the bow in these sites, much has been written and pictured which leads one to assume that the bow was not in use in the Americas prior to Pueblo I, showing a lack of both first-hand information and an intelligent working knowledge of the subject.

As a concrete example, under Baker and Kidder in AMERICAN ANTIQUITY, Vol. 3, No. 1, we find: "These suppositions are based on the apparent total absence from all respectably ancient deposits of small, light points suitable for the tipping of arrows; and conversely, by the presence in such deposits of larger points, of size and weight appropriate for service with the heavier longer darts propelled by the spear thrower."

I don't know just which sites Baker and Kidder have in mind when they refer to "respectably ancient deposits," but I will name four sites that I consider both ancient and respectable, and I believe the majority of archaeologists will agree with me in this selection: Signal Butte and Sheep Mountain in Nebraska, the Lindenmeier Site in Colorado, and Pictograph Cave in Montana.

I have seen hundreds of points from all of these sites and I say that ninety-five per cent of the points can be hafted on a shaft and shot efficiently with a bow. I am writing from personal experience, not hearsay or second-hand information.

For a number of years I have been interested in archery. I have made dozens of bows, hundreds of arrows, have successfully shot in tournaments, and, on a trip to the Jackson Hole, killed a bull elk with the bow and arrow; so I claim some knowledge of the subject.

Within the past few months I have hafted points from Signal Butte I, Sheep Mountain, and Pictograph Cave and shot them from 175 yards to 200 yards. The bow used was made from an osage sapling with a hand axe and a pocket knife. The points used were above the average for size, running over 5 cm. in length, the complete arrow weighing only 450 grains, as against the 600 grains of the arrow I used in killing the elk. I was unable to obtain a Folsom point from the Lindenmeier Site, but if there ever was a point that was made for efficient bow and arrow shooting, it is a Folsom point.

It is true that no evidence of a bow has been found in any of these sites. Neither has an atlatl been found, and the points from these sites are much more adaptable to use in an arrow than in the heavy spear that would be used with the atlatl.

Again, in AMERICAN ANTIQUITY, April, 1936, Mrs. E. W. Crozer Campbell, in *Archaeological Problems in the California Desert*, writes: "Here occur projectile points of the Pinto type, much too large and heavy to be considered arrow points." From my cases I hafted a point six cm. in length, which is about one cm. longer than any point she pictures in her paper, and shot the arrow 165 yards with the little "Indian Bow."

We know the bow was in use in Europe during early Neolithic times, as it is pictured in early Neolithic stations. In North America the bow is shown in both pictographs and petroglyphs at sites that in my opinion antedate Basket Maker II.

The concensus of opinion seems to be that the bow first made its appearance in the Southwest about the time of Pueblo I, and that it was brought into the Southwest by new peoples. I suggest, and not mildly, that these invaders were from the north, and that the bow had been handed down to them by the peoples of Signal Butte I, Sheep Mountain, and other respectably ancient northern sites.

JIM BROWNE
1863 Wazee St.
Denver, Colorado

NORTHWEST COAST MIDDENS

The many large mounds of shell deposits that are scattered all along our northwest coast, described by scientists as "middens," make it clear that man on this continent dates back many thousands of years. This has been amply

indicated by the mass of material which has been recovered from what is known as the Great Fraser Midden. Situated on the north bank of the north arm of the Fraser River (an area now actually within the city limits of Vancouver, British Columbia), the midden was used as a camp site and was formed from the accumulations of camp refuse while it faced directly on the Gulf of Georgia. As the centuries passed, however, Sea Island was formed by the silt from the Fraser River, so that today the Great Fraser Midden faces Sea Island, and is some miles from where the Fraser River empties into the sound.

Attention was first attracted to this midden when clearing the forest growth preparatory to the cutting-through of roads for the district now called Marpole, for it was during this process that quantities of skeletal remains and artifacts were revealed. Local anthropologists realized at once that here had been a very old camp site, so the full extent of the midden was carefully measured by Professor Charles Hill-Tout, assisted by Mr. F. Monkton, a mining engineer. It was found to have an area of some 4.5 acres, with a frontage of some 300 feet on what was once the sea. The depth of the shell deposit averaged five feet, but much of this shell mass had a depth of fifteen feet.

In 1930 the Art, Historical and Scientific Association controller of the Vancouver City Museum, was in a position to examine the small remaining portion of this ancient midden. Under the skilful management of Mr. Herman Leisk, a large mass of material was uncovered, including the skeletal remains of over one hundred individuals, and quantities of stone and bone artifacts. Many of the artifacts gave evidence that their users had been expert craftsmen, capable of embellishing their implements with skilful and artistic carvings.

Each item was most carefully marked as to depth and exact position, and when all the material was, so to speak, placed on parade, each item in its own depth-stratum, much valuable information was gleaned. For instance, it was clearly demonstrated that the earlier craftsman was more painstaking in the fashioning of, say, a barbed spear point than was the later craftsman of the upper layers. Artifacts which were scarce at the lowest levels became more common at the higher levels, but of less skilled workmanship.

The method followed in examining this midden was to trench down to rock bottom, then work forward on a face. In this manner scarcely any item of interest was overlooked, and the exact position of the item could be carefully measured from the surface.

Probably the most interesting discovery was that of the burial remains of a man of high rank, and about twenty-two to twenty-four years of age. The body was encased in sheets of beaten native copper, with a copper crown or band on the head. With him were the remains of two females of the same age who apparently had been killed, for their skulls were crushed. These two young women, together with all the man's personal effects, were probably sacrificed that they might accompany him into the Great Unknown.

Four feet down from the top level of the shell deposit, the head of a large

stone image appeared. It proved to be eleven inches in height, and to weigh forty pounds. The image was seated on the apex of a pyramid made so that its four corners faced the cardinal points of the compass. The four sides of the pyramid were faced with rounded mountain-stream stones about the size of polo balls, and the inside was packed with bright orange-colored sand in which fragments of human bone were found. The pyramid was 4.5 feet high. Was this a shrine or altar at which the medicine man stood, or a memorial to some great chieftain or hunter? What tribal meetings were held around this carefully made cairn?

On the lower levels a new type of skull was found, a definite long-head. The keel-ridge running from the front to the top of the skull has no counterpart today except among the Eskimos. If these men were Eskimo, they would have been retreating at the edge of the last ice-cap, and their antiquity would be thousands of years prior to our present estimate of about 3,000 years. Why did this race disappear? Did the encroaching round-headed race exterminate them, absorb them, or drive them away?

This midden is only one of many along our Northwest coast: forest-grown, forgotten campsites of a very early man; a people who had to wrest their chief food supply from the sea; a clam-eating people who always lived close to their food supply: a people, however, who, judged by their carvings on bone and stone, had attained a very high cultural level.

Many are the mysteries yet to be unfolded when careful scientific work is done with the mounds now lying undisturbed. Work such as this calls for great care, but it will amply repay any group of genuine scientists who can command the necessary finances to carry it to its conclusion in any midden chosen.

T. P. O. MENZIES
City Museum
Vancouver, B. C.

NOTES AND NEWS

Southeastern Area

The restoration of a prehistoric Indian ceremonial earth lodge at the Ocmulgee National Monument, Macon, Georgia, was opened for inspection by the visiting public on November 24, 1937.

The Department of Anthropology, University of Tennessee, is setting up a laboratory for the analytical study, preparatory to cultural classifications, of archaeological materials and data obtained as the result of extensive field operations conducted during the past several years at various sites under the personal direction of T. M. N. Lewis. The laboratory project is being developed with the assistance of Earl L. Loyster, formerly of the Milwaukee Public Museum.

Northeastern Area

Mr. John H. Bailey, of the Champlain Valley Archaeological Society, reports as follows on the significant discoveries made under his direction in 1937:

"The Champlain Valley Archaeological Society excavated from August to November on a small village site at the junction of Dead and Otter creeks, near the village of Vergennes, Vermont, brought to the society's attention by Mr. William A. Ross of St. Albans, Vermont, who assisted in its excavation. The site occupied a spur of land, about an acre in extent, jutting into the marsh bordering Dead Creek. It was covered with a refuse layer ranging in depth from four to fourteen inches, which had never been plowed. This produced: nine fragments of semi-lunar ground-slate knives; a broad-bladed lance head or knife of the same material; several short shallow gouges; sinewstones; celts; a wide variety of notched, stemmed, and triangular projectile points of various sizes; knife blades; perforators; scrapers; numerous sherds of Woodland pottery; and steatite pot fragments. Quartzite, chert, and argillite constitute the materials of the chipped implements.

"The total complex clearly represents a single occupation, differing but little from that found by Ritchie, of the Rochester Museum of Arts and Sciences, in the summer of the same year, on two large sites in central New York, and it apparently represents another focus of his newly defined, but still unnamed aspect, reported on in this section of the January, 1938, issue." (*W.A.R.*)

Dr. Warren King Moorehead sends the following notice of his coming retirement as Director of the Department of American Archaeology of Phillips Academy, Andover:

"After fifty-one years service in American archaeology, thirty-seven years of this period being spent at Andover, I retire, becoming Emeritus in June of this year.

"May I be permitted to say to my many professional friends and acquaintances that during this lengthy period I have made numerous and worthwhile

contacts and friendships with scores of persons who are interested in our Indians. With the exception of one or two publications, I shall endeavor, health and strength permitting, to devote my leisure time to the preparation of a resumé of our treatment of the Indians during the past century. I served on the United States Board of Indian Commissioners for twenty-six years, and have available for study a great mass of material dealing with the Indians, their problems, and needs. This projected work is in no sense scientific. It is rather in the nature of a 'human document.'

"I trust that my many friends, professional and personal, will meet with abundant and well-merited success in their studies and undertakings." (*W.A.R.*)

Reports on the Martha's Vineyard excavation of 1936 and on the Nevin shell heap work completed last fall, by Messrs. Douglas S. Byers and Frederick Johnson of the Department of American Archaeology, Phillips Academy, Andover, are expected to appear about June and December, respectively, of this year.

During the coming summer they expect to investigate a second shell heap at Blue Hill, which may pertain to a later period of occupation than the important Nevin midden.

At present they are engaged in the complete revision and reinstallation of the archaeological collections of the Phillips Academy museum. (*W.A.R.*)

Dr. Frank G. Speck of the University of Pennsylvania has resumed his research in Catawba social organizations and Cherokee ceremonies. He has made an initial trip to Hounia, Louisiana, for general ethnological studies. (*W.A.R.*)

Middle American Area

Not so much research was done in this area during the winter season of 1936–1937 as in former years. No reports of any work have been received from the American Museum of Natural History, the Peabody Museums of Harvard or Yale Universities, the University of California, Tulane University, Gila Pueblo, the Bureau of American Ethnology, or European institutions, and most of these are known to have had no expeditions. This is by no means to be regretted, since the practice of ceasing active field research one year in every two or three in order to digest and prepare for publication the data secured is one worthy of emulation.

The *Dirección de Monumentos Prehispánicos* of the *Secretaría de Educación Pública* of the Mexican Government continued its valuable work in various localities, as may be seen in the following translation of a report from Sr. Eduardo Noguera.

"*CHICHEN ITZA*, Yucatan. The clearing and preservation of the structures was continued, especially the North Temple of the Ball-Court. Here a restoration was made of the reliefs found within the temple, and the artist

Miguel Angel Fernández was able to make a water-color drawing of the scenes depicted. It seems to show a procession of warriors and other persons paying their respects to a great chief or priest whose body appears to be shown in the lower part of the relief. The most important discoveries were made in the structure 'El Castillo.' In the interior of the pyramid that supports the apical temple another older temple was discovered, of an architectural type very similar to that above it, and in perfect state of preservation. Within the double chamber was found a 'Chac-mool' figure and on the floor of the interior room a jaguar figure. The latter is carved of a single block of stone, painted red, and with the jaguar spots represented by large inset disks of jade. On the back of the animal, as on a seat, lay a disk of turquoise mosaic, a necklace of shell beads, and a jade pendant in the form of a human face. (For a description of this discovery, see Carnegie Institution Supplementary Publications, No. 32.)

"*UXMAL*, Yucatan. Special attention was paid to the work of conservation and reconstruction of the Pyramid of the Magician (also called House of the Dwarf) and of the Nunnery rectangle, the structures that are most damaged. Also sanitary work and drainage was done to prevent the propagation of noxious insects and of malaria.

"Other important ruins of Yucatan were examined and the edifices most in need of repairs were attended to. The Yucatan work was under the charge of Srs. Miguel A. Fernández, E. Erosa, and M. Cirerol.

"*PALENQUE*, Chiapas. The entire zone was cleared to remove the exuberant vegetation that constantly overgrows the ruins. Restoration and repair were done in the Court of the Tower (Palace) and especial attention was paid to the repair of the relief of several tablets. Drawings were made of the paintings and reliefs recently found by Miguel Angel Fernández.

"*TAJIN*, Vera Cruz. The clearing of the zone around this pyramid resulted in the discovery of numerous small mounds and revealed a greater expanse of this prehispanic city. Sr. Agustín García supervised the work of repair of the main pyramid with the niches, the largest and most important in the zone, and of the Structure of the Columns. Here the upper part is being cleared, and the scattered columns are being replaced; these columns are covered with most artistic reliefs that have been copied by Sr. Villagra.

"*CHOLULA*, Puebla. New structures are constantly being uncovered in the interior of this immense pyramid. More than four kilometers (two and a half miles) of tunnels in different directions have to date (August) been opened in this pyramid. The two principal ones traverse it from north to south and east to west. The opening of these tunnels revealed a number of structures of a period preceding the Cholultec, and the study of the pottery by Sr. Eduardo Noguera has proved the former existence of three distinct cultures at this site.

"*MALINALCO*, Mexico. Following the discovery of a temple carved in the solid rock at the summit of a hill near the town of Malinalco, repairs and restorations have been made of the other non-monolithic structures in this

region. Similar conservation work was done at CALIXTLAHUACA, also in the State of Mexico. These projects were under the direction of Sr. J. Payon.

"*MONTE ALBAN*, Oaxaca. Excavations at this site were continued by Dr. Alfonso Caso of the *Instituto Panamericano de Geografía* in accord with the contract between that institution and the governmental *Departamento de Monumentos*. The South Platform was investigated and excavated and many new tombs were discovered, three of which contained wall paintings of great artistic and archaeological value.

"Brief investigations were made by Sr. Eduardo Noguera at several places in the State of Puebla: TEPEACA, AMALUCAN, the banks of RIO ATOYAC and TEHUACAN, with the purpose of studying the relationships and extensions of Cholultecan ceramics. To date the study of this material has not been completed, but it promises to afford important data and elucidate some present problems.

"TEXMELICAN, Guerrero. Sr. José Payon made a brief investigation to ascertain the archaeological characteristics of the region, which seemed to be of great importance on account of the many objects of diverse materials that had been found in former years. He secured very important new archaeological and ethnographical data.

"In collaboration with the Carnegie Institution of Washington an expedition was projected for the fall of 1937 in the region of the Tuxtlas, in the state of Vera Cruz."

The discovery of the buried temple and the jaguar throne at Chichen Itza has been termed one of the most spectacular archaeological discoveries of recent years in America. The temple surmounted a smaller pyramid that had been covered over by the later one; it had been filled up with masonry to support the weight placed above it, and was intact. The rear wall was studded with the heads of human femurs, probably from sacrificial victims. The jaguar throne was encased in a box of massive limestone blocks and slabs. The teeth were of a hard white stone. All the objects were left in place and made visible to visitors; that this privilege was abused is indicated by a report that some of the objects have been stolen. We trust that by this time they have been recovered. I am uncertain whether the publication of the Carnegie Institution referred to by Sr. Noguera is identical with their *News Service Bulletin*, School Edition, Vol. 4, No. 12, April 25, 1937, which describes the discovery.

The rock-hewn temple at Malinalco was a surprising discovery of a new type for Mexico. It follows the usual highland Mexican architectural plan with steep steps and balustrades. The roof, presumably originally of perishable materials, is now gone. The temple itself is round, a shape unusual in Mexico and presumably associated with the Wind God Ehecatl. Sculptures of jaguars, snakes, and eagles embellish it.

We understand that among the discoveries made at Monte Alban was that of a skeleton, probably that of a ruler, in the frescoed Tomb 104. Work was

expected to be renewed here in November, 1937, as well as researches at Mitla and in the Mixteca region. The Mexican Government plans to build a museum at Monte Alban in which will be exhibited all the objects found in the excavations, including the beautiful collection of jewelry and other ornaments made several years ago.

Fuller details upon his extensive work in the Zapotec-Mixtec region is given by Dr. Caso in the current number of the *Boletín Bibliográfico de Antropologia Americana*, from which the following translation is made: "The explorations lasted two and one-half months, beginning with a preliminary investigation at Yucuñudahui, near Nochistlan in the northern Mixteca region; here a ball-court, a temple, and a tomb with a well-preserved beam roof were found. This tomb indicates that the culture of the ancient Mixtecs had analogies with both the Zapotec and the Toltec. Later, excavations were made at Tilantongo, the old Mixtec capital; the ruins of a large edifice, possibly a palace, were found, and the site of the ancient capital on a small hill was examined."

After the explorations in the Mixtec region, excavations were continued at Monte Alban. In one of the temples rich ornaments of jade were found, and eight tombs were opened, in three of which the walls were decorated with painted frescoes. Some of these are beautiful, well preserved, and very important, as they consist of figures of deities, well adorned and with their names in hieroglyphs, as well as of offerings, glyphs, and animals. The three frescoed tombs, 103, 104 and 105, belong to the third epoch of Monte Alban which shows connections with the culture of Teotihuacan; the frescoes also resemble those at the latter Toltec site, and differ from the pictures in the codices.

Sr. Guy Stresser-Péan, a student of Rivet's, has been making archaeological investigations the past few months in the Huaxtec region, as well as collecting important ethnological and linguistic data.

Gila Pueblo of Globe has been granted a permit from the Mexican Government for archaeological researches in Tamaulipas and the vicinity of Tampico, a project that E. B. Sayles has been eager to pursue for some time, but I understand that, due to more urgent work in Arizona, the expedition will not start this winter. The American Museum of Natural History has entered a year of archaeological research in Sonora, Sinaloa, and western Durango under the leadership of Gordon Eckholm, now in the field. Both of these researches in little-known parts of northern Mexico should produce information of the greatest importance.

The University Museum, Philadelphia, will have no expedition at Piedras Negras, Guatemala, this spring (1938), and the staff will devote its energies to the preparation of reports of work done in the preceding seven years.

Among the grants recently made by the American Philosophical Society was one to Dr. Mary Butler "for the study of Maya archaeological material, chiefly pottery, from the Chama district of the highlands of Guatemala."

A number of important works on the archaeology of Middle America have appeared during the past year, among which one should not fail to note Ricketson's report on Uaxactun, and Lothrop's report on Zacualpa, both published by the Carnegie Institution. Lothrop's magnificent work on Cocle, Part I, has just appeared as Memoir VII of the Peabody Museum, Harvard University.

At last an English translation of the most important source book upon the Maya has appeared. Bishop Diego de Landa's "Yucatan Before and After the Conquest," 1549–1579, has just been published in two editions by The Maya Society with headquarters at the Johns Hopkins University, Baltimore. Translation with notes are by William Gates. Both editions are illustrated and are admirable examples of typography, especially the more expensive limited edition on special paper with the illustrations hand colored by Mr. Gates. (*J.A.M.*)

For Your Information

The *Tree-Ring Bulletin*, now in its third year, is the official organ of the Tree-Ring Society. The common purpose of the Society and its *Bulletin* is to coördinate endeavors in all phases of tree-ring studies, chiefly by providing a channel for publication of the results from research. Published materials should be helpful not only to the research worker in dendrochronology but also to those interested and working in the several fields of science with which dendrochronology makes contact. Some of the closely related fields are botany, forestry, climatology, geology, astronomy, and archaeology. The fee for membership in the Society is $1.50, payable annually, and entitles one to receive the four quarterly issues of the *Tree-Ring Bulletin*.

The *Bulletin* is not limited to articles of and for the Southwest. Tree-ring data from any region are very welcome. Nor is there any limitation to particular phases of tree-ring research.

BOOK REVIEWS

Rediscovering Illinois: Archaeological Explorations in and around Fulton County. FAY-COOPER COLE and THORNE DEUEL. (University of Chicago Publications in Anthropology, Archaeological Series, University of Chicago Press, Chicago, 1937.)

The patience of students in adjoining fields, awaiting a published report on the intensive investigations conducted in Illinois during the past twelve years, is finally rewarded in this carefully prepared work, which covers the results of research in Fulton County. Although the book deals specifically with a very limited area within the state, the reader will soon discover that cultural complexes and sequences treated in the text are of much wider import than the immediate locale of operations. The authors make no claim that these cultural and chronological manifestations will be found representative for the area outside that described, but the broader classifications, at least, are certainly based upon a much wider knowledge of data within the state, and throughout a field embracing many adjacent states. There is the plausible implication that these complexes and sequences may illustrate, fundamentaliy, and serve as an initial cross section of Illinois archaeology.

Specific factual and discussive presentations are preceded by a general introduction and an exposition of methods. The introduction consists largely of a popularized summary of purposes, problems and program, and correlates cultural and historical conclusions. This portion of the book is apparently intended primarily for the non-specialist, although the inclusion of classificatory, survey, and other technical terminology will, I fear, prove a confusing element to an important number of the amateur students. However, in all fairness, it should be said that these terms are fully defined and explained either in later chapters or in the excellent glossary which concludes the text.

The presentation of survey and excavation purposes and methods is exceptionally well done, and will no doubt serve the needs of the instructor to excellent advantage. The reviewer feels, however, that a false impression of the rigidity of excavation methods is created; methods that are non-elastic and cannot yield to the specific nature of the feature encountered. For example, the vertical-slicing technique is described without consideration of any alternative or deviation (p. 26), whereas the reviewer's experience has convinced him that technical methods are like tools: certain ones will prove most useful under certain conditions; certain others, under other conditions. Figuratively, all eating should not be accomplished with either a fork or a spoon; the field technique must be selected to meet the demands of the specific field. It is the reviewer's first-hand observation that the authors agree with this in practice if not in statement.

At this stage of development in archaeology for the eastern half of the United States, any positive treatment of culture classification cannot fail to stir up controversy. Of the authors' contribution to this subject, it should be

said initially that it is the most ambitious attempt to reduce field and laboratory data to lucid order in terms of culture that has ever been published for the Woodlands section of the Middle West, however deliberate and cautious may have been the course of its shaping.

The chapter opens with a brief history of the formulating of the taxonomic method, which is incorrectly referred to as a "classification of archaeological sites and materials of the Mississippi drainage . . ." (p. 34). I should like to call to the authors' attention the omission of Dr. James B. Griffin's name from the list of those who participated in the original classificatory conference. Moreover, inasmuch as the remainder of taxonomic divisions are accepted as endorsed at the Indianapolis conference, one wonders why no mention is made of that most generalized of all divisions, the "base." Although it is not employed in Illinois, it is a generally recognized class in the taxonomic scheme.

There follow lists of determinants for the two great culture patterns involved in the work: the Mississippi and Woodland, following a terminology which has been rather generally accepted. The advisability of including negative traits will be questioned by some. It is the reviewer's position that these, as given here and later in Appendix II, are trait complexes, not determinant complexes, since determinants are diagnostic traits in a comparison of two culture complexes. Consequently, that which is a diagnostic trait in one comparison may become a link trait in another, and it follows that there can be no complex of diagnostic traits, or determinants for a cultural division to be exhibited as standard in all comparisons. Moreover, it is the reviewer's reaction that these trait complexes apply more accurately to certain phases, aspects, or foci in Illinois than to the more geographically comprehensive patterns.

The use of "Mississippi basic culture" (p. 38), an original term now in disuse, is probably due to an oversight.

Having presented these general views of the Woodland and Mississippi patterns, the task of classifying Fulton County manifestations is undertaken. Preceding the actual analytical study of materials, there is the expression of a preconceived conviction that the Woodland and Mississippi patterns are represented in Fulton County. "To test these convictions, also to obtain a purely objective view of all materials recorded, the larger cultural complexes, such as pottery and projectile points, were spread out and separated into types, without regard to place of occurrence or association with other objects" (p. 39). Although this is not the classificatory procedure originally advanced by the devisers of the taxonomic method employed, or in use by other advocates of the method, it is interesting to note that it produced substantially the same results. Of seven types of pottery objectively determined, a group of five related types turned out to have been found associated with similar complexes of Woodland-like materials. A sixth type occurred where no definite associations could be determined. Type 7 had Mississippi associations. Similarly, the projectile points fell into types with definite Mississippi and Woodland associations. Other types of artifacts were not present in sufficient quantity to lend them-

selves to this objective method, and such traits as house type, mound structure, and burial procedure could hardly be handled conveniently in this manner. Actually, therefore, the method was employed only in analyzing traits represented by artifact types present in considerable quantity. The actual trait complexes for Fulton County manifestations listed elsewhere in the report must have been obtained largely by other means than this objective method.

The reviewer can only look upon this procedure as an interesting experiment. The more simple and direct method is that of analyzing materials from a site or community as such, comparing the list of traits so determined with similarly determined trait complexes from other sites or communities, and classifying on a basis of similarity or dissimilarity to establish foci. Comparisons of foci might serve to establish aspects, or more general classes. Naturally, since its determining traits are more general and fewer in number, previously identified patterns might be recognized almost immediately; their subdivisions, only after considerably more data were made available. Deuel (pp. 218–219) accurately outlines this method as an alternative for the one employed.

One is sorely tempted to draw a comparison with the biological classification. Employing this subjective method to identify various sub-varieties of grasshoppers, one would put all the legs in one pile, the wings in another, and so on, without regard to which grasshoppers the various parts came from, respectively. No doubt one could thus test the accuracy of original associations, and in doing so actually determine the characteristic traits for each variety.

The detailed descriptions of excavations are models of presentation, and serve to illustrate the technical care and precision with which the work was conducted. There is a cultural analysis accompanying the report for each site or community.

The six cultural divisions apparent from this research are discussed at some length by way of conclusions. These divisions are: Black Sand, Red Ochre, Central Basin, Hopewellian, Middle Mississippi, and Maples Mills. The authors admit the important part played by pottery in cultural determinations (p. 199), citing as justification a dearth of other materials at certain sites, and the fact that pottery possesses a number of diagnostic features. The absence of cultural data could hardly justify any classification, but the wholly tentative nature of any classification may warrant initial attempts on a basis of rather limited data. As regards the complexity of the subject of pottery, however, the fact that all cultural subjects possess a plurality of diagnostic features is slowly gaining recognition. A recent discussion with Cole substantiates his concurrence with this view. Whereas pottery may in most instances offer more than any other subject in the way of culture indicators, it is extremely doubtful that its importance could ever warrant classification primarily on a basis of pottery factors.

The assignment of these six divisions to class status in the classification is, in the reviewer's opinion, the weak department of the entire report. The Red Ochre manifestation can only be justified as a focus in the Woodland Pattern

on the strength of the data presented. How possibly could a class with the broad general features of a phase be determined from three closely associated sites in one county? As proposed and defined, these classificatory compartments are only to be employed as needed, and the data on Red Ochre available at the writing of this report are satisfactorily taken care of by the focus. Maples Mills apparently is also a Woodland focus. The Black Sand Focus is so designated. Foci are also recognized within the Central Basin, Hopewellian, and Middle Mississippi phases of Fulton County, although the authors, with their collective attention centered primarily upon patterns, and such immediate subdivisions of patterns as might be justified, appear to look upon the focus as the most remote and difficult of attainment of all classes, whereas the focus lies directly under their very feet, the logical starting point of classification. Deuel actually admits this position in Appendix I when he says: ". . . the component or complex of traits at actual sites must form the basis of the classification" (p. 207, footnote 4).

On the same page, Deuel presents, as equally applicable, the two procedures of classification: (1) that which starts with the "largest unit" and works "downward"; and (2) that "beginning with the smallest units and successively combining them into larger ones." If the treatment of classifications in this work are representative of the No. 1 method, the apparent results would not be cited by the reviewer as a recommendation for the continued use of that method.

Hopewellian has been classified as a Woodland phase (p. 200). Apparently, pottery data serve primarily as a foundation for this stand, with general chipped-stone and burial traits serving to some extent. The trouble here again seems to be the technical viewpoint which induces the worker to start with the pattern, the most generalized cultural division, and work "down" toward the more specialized divisions, never fully arriving at the natural starting point, the focus. Thus, having to start with the pattern, one is confronted by the necessity of choosing between the two patterns identified for the Mississippi Valley: the Woodland and Mississippi; a manifestation must be assigned either to the Woodland or to the Mississippi pattern. Deuel reflects this attitude in his stated conclusion that Hopewellian must be Woodland since it is more like Woodland than it is like Mississippi (pp. 211–212). That this manifestation could possibly be a phase of some unidentified pattern, appears to be outside the range of Deuel's conception, due to this two-pattern limitation.

Deuel's stand on the Woodland category, not only for Fulton County manifestations of Hopewellian, but for the Trempealeau Focus as well, is rather difficult to analyze. He has established the fact for Fulton County, previously known for Hopewellian in general, that there are a number of linked traits in any comparison with Woodland manifestations. These are general traits such as would logically apply to a phase, and relate to pottery, chipped-stone, and burial procedure. However, Deuel's own Hopewellian complex, as given in Appendix II (p. 222), includes only five out of thirty-two listed traits that would

be generally accepted as characteristic for Woodland; and this is a very generous estimate. Are we to conclude that these five or less traits have greater diagnostic value than the twenty-seven or more traits that are not indicative of Woodland?

The argument that there is apparent cultural continuity exhibited in a series leading from Woodland (Central Basin Phase) to Hopewellian pottery (p. 200) does not apply. The taxonomic method is essentially based upon cultural factors alone, yet here the factor of temporal succession is employed in support of the classification presented. Moreover, the temporal sequence is only apparent, in the nature of coinciding with the expected, and does not apply to traits other than ceramic. The fact is interesting, and should have been presented, but not in support of a purely cultural classification.

Table 1 of Appendix I lists pattern determinants for the Woodland and Mississippi patterns in a vertical series, and various Illinois and other Mississippi Valley components, with a few foci mixed in, in horizontal series, with tabulations to show similarities and dissimilarities warranting the classificatory assignments. With the Woodland group, on the basis of traits so listed, is the Trempealeau Focus. The twelve Woodland traits shared by Trempealeau, according to this table, include: burials predominantly flexed; grave goods, scarce or absent; grave goods chiefly of stone. Actually, Trempealeau Focus burials are never flexed, grave goods are the usual thing, and copper is present in a grave more commonly than stone. In addition, there are a number of burial traits, no less important or more detailed than those listed, which are characteristic for Trempealeau and not for Woodland. Similarly, throughout the table, important Trempealeau traits, which are also Hopewellian traits, and never Woodland traits, have been omitted. The reason for this is at once apparent: this is a table based on Woodland and Mississippi traits, and the Trempealeau traits referred to as omitted from the complex are neither Woodland nor Mississippi. The possibility of Hopewellian lying outside both of these patterns, although seriously considered by all other students of the Hopewellian Phase, is in no instance so much as mentioned in dismissal in this report.

There is much of interest in that portion of the Conclusions dealing with chronology. In all instances where stratigraphy is apparent Mississippi overlies Woodland. There is evidence that either the Black Sand or Red Ochre manifestations, both Woodland, are earliest in the picture; probably the former. In succession upwards come the Morton Focus (Woodland), the Hopewellian Phase, and finally, the Middle Mississippi Phase. There is, however, the possibility of late Woodland manifestations, including Maples Mills, being contemporaneous with Middle Mississippi. Much of this cultural stratigraphy parallels that indicated for related manifestations in adjacent areas of the Northern Mississippi province, although the Trempealeau Focus of Hopewellian appears to be nearer the bottom of the pile in Wisconsin. The summary of these chronological conclusions is presented in the form of a tentative cul-

tural history of Fulton County which is brief but prophetic of future possibilities in Mississippi Valley archaeology.

A great deal that is pertinent to the entire presentation of facts and conclusions is contained in sixty-seven pages of appendices. These include: the Application of a Classificatory Method to Mississippi Valley Archaeology, by Deuel, which has been mentioned elsewhere in this review, and which deserves the careful attention of all students of classification; Diagnostic Traits of Woodland and Mississippi Units in Fulton County, separately listing several subdivisions; Details of Special Plates and Figures, strangely divorced from the illustrations described; and two final chapters by Neumann on human and faunal physical remains.

Deuel's presentation of the Upper Mississippi Phase will not satisfy students of the Oneota Aspect of that phase, which is represented in the discussion only by the Grand River Focus, and that under the cloud of "probable" (p. 216). Deuel's conception of the Mississippi Pattern seems to be decidedly unbalanced in favor of Middle Mississippi, and the Upper Phase appears to be based upon a knowledge of the Fort Ancient Aspect and a corresponding lack of accurate information on, or an unaccountable disregard for the Oneota. It is true that published reports on the Oneota are inadequate, but ample data had been made available to the author. This near omission is particularly unfortunate since the whole conception of an Upper Mississippi Phase had its origin from investigations of Oneota manifestations.

In Appendix IV, a preliminary study of the crania from Fulton County is contributed by Neumann. The results of this study are generally stated in the author's own words: "When we are confronted with the entire collection of skulls from Fulton County, the variability of the material is striking. In a number of individuals there appears a combination of racial characters, giving rise to types which are quite Australoid, Negroid, and even Caucasoid in appearance; but all of them possess characters generally associated with Mongoloids that speak for intensive intermixture." Neumann points out that this bears out Hooton's position that the American Indians can be classified as a single racial entity only if one admits the composite and exceedingly variable nature of that entity (pp. 261–262).

Certain physical types were found consistently associated with certain cultural manifestations. Moreover, "The apparent cultural continuity in pottery types running from Black Sand through the Central Basin to Hopewellian seems to be duplicated in the change in physical type . . ." (p. 263).

Following is a thorough factual statement on the faunal remains, also by Neumann, based upon careful analysis, accompanied by a table showing varieties and occurrence; and an identification of shells by Baker.

Other appendices include: A list of county symbols used in the state survey; a well conceived and excellently executed glossary of terms employed; and an index.

Summarizing, the reviewer is impressed with the quantity of information

contained in this work; with the apparent purpose of the authors to produce a thorough and comprehensive report, both from a factual and a technological point of view; with the plentiful evidence of long, tireless labors in field and laboratory devoted to the execution of this purpose; and with the general excellence of the product. If this review appears to contain a preponderance of adverse criticism, it is not intended to minimize the recognized value of the work as a whole, or the reviewer's lack of respect and admiration for the authors. Rather, it is one man's reaction specifically to the taxonomic methodology which holds such an important place in the report, and in the mind of the reviewer; presented with the full realization that this method for culture classification is in an experimental stage, as yet too immature to aspire to standardization; and offered with the hope that it will be accepted as wholly constructive in its purpose.

W. C. McKern

Petroglyphs of Oregon. L. S. Cressman. (University of Oregon Monographs, Studies in Anthropology No. 2, 76 pp., 4 plates, 52 figs., 22 maps, 1 chart, Eugene, Oregon, 1937. 75 cents.)

This valuable monograph is the first extensive and systematic treatment of the petroglyphs of any considerable area in the Northwest. During three years of research, the author personally visited most of the sites described and believes that probably ninety percent or more of Oregon petroglyphs have now been studied. Dr. Cressman's cautious treatment of his data is essentially analytical and comparative.

Part I describes the sixty sites which have petroglyphs (designs cut on rock faces) and pictographs (designs painted on rock faces in red and occasionally in blue-green, yellow or black). Illustrations are largely pen and ink drawings.

Part II relates the occurrence of sites in physiographic areas. Like northern California, there is a striking scarcity of sites in the wooded area west of the Cascade range.

Part III breaks down the complexes at each site into design elements, of which forty-four are treated: twelve faunistic, one floristic, seven pertaining to human beings, one arrow, and twenty-three geometric (including sun and star). The distribution of each element is given, twenty-two being on maps. These data are also summarized in a chart. This procedure not only aids statements of the content of sites and definitions of style, but allows comparisons of sites.

Part IV, General Considerations, compares the styles of the four main areas (1) The Willamette Valley west of the Cascades has a few primitive and presumably early petroglyphs which are unlike other types of local stone art. (2) The semi-arid southeastern portion of Oregon is related to the Great Basin in its curvilinear petroglyphs. (3) The pictographs of the north central part of the state have northern affiliations. (4) The Klamath Basin petroglyphs and pictographs are most related to those of northeastern California.

Interpretation of petroglyphs is mentioned briefly and cautiously, and is reserved for a future paper.

Part V, Chronology, lists four age criteria: weathering, superimposition of designs, association with now extinct animals, and association with elements of known cultural age; and finds that only the last holds promise in this area. However, the author makes little effort to erect a chronological scheme. The horse, which is occasionally represented, is apparently the only important and common element of known age.

Part VI summarizes the findings.

JULIAN H. STEWARD

Indian Rock Writing in Idaho. RICHARD P. ERWIN. (Idaho State Historical Society, Biennial Report 12, for 1929–1930, pp. 33–111, 58 plates, Boise, 1930.)

For any student of petroglyphs, this paper. containing descriptions of sixty-nine sites scattered throughout Idaho provides valuable source material. Many of the sites are well illustrated in the fifty-eight plates, all of which are photographs.

On the interpretative side, the paper is open to criticism. Long and detailed interpretations of many of the glyphs are quoted from John E. Rees, who had extended contact with the Lemhi Shoshoni. That many pictographs which include representations of the horse are assignable to the modern tribes of Idaho is probable. That some of these were, like pictographs on tipis and buffalo robes, of historic scenes is possible. That Rees or anyone else can interpret them in such detail is highly improbable. Equally positive interpretations of purely geometric and probably older petroglyphs are unwarranted.

Omitting questions of interpretations, however, the raw material in the paper is of considerable value.

JULIAN H. STEWARD

SOME RECENT PUBLICATIONS

UPPER NORTH AMERICA

Bailey, John H., A Rock Shelter at Fort Ticonderoga (New York). Champlain Valley Archaeological Society, Bulletin 1, No. 1, 16 pp., illustrated, Fort Ticonderoga, 1937.

Brand, Donald D., The Status of Anthropology in the Western United States. New Mexico Anthropologist 2, No. 1: 4–16, Albuquerque: University of New Mexico, 1937.

Champe, John L., Explorations in Nebraska Archeology. Nebraska History Magazine 18, No. 2: 116–125, Lincoln, 1937.

Cole, Fay-Cooper, and Thorne Deuel, Rediscovering Illinois: Archaeological Explorations in and around Fulton County. University of Chicago Publications in Anthropology, Archaeological Series 16, 295 pp. 36 plates, 37 figs., Chicago: University of Chicago Press, 1937. Price $2.00.

Colton, Harold S., and Lyndon L. Hargrave, Handbook of Northern Arizona Pottery Wares. Museum of Northern Arizona, Bulletin 11, pp. i–xiii, 1–268, 62 figs., Flagstaff, 1937.

Douglas, A. E., Tree-Ring Work, 1937. Tree-Ring Bulletin 4, No. 1: 3–6, Tucson, 1937.

Ezell, Paul, Shell Work of the Prehistoric Southwest. The Kiva 3, No. 3, Tucson: Arizona State Museum, 1937.

Frey, S. L., Prehistoric Mohawk Villages (New York). The Van Epps-Hartley Bulletin 2, No. 2: 7–11, Scotia, N. Y., 1938.

Harrington, M. R., Excavation of Pueblo Grande de Nevada (Nevada). Texas Archeological and Paleontological Society, Bulletin 9: 130–145, 4 plates, Abilene, 1937.

Haury, Emil W., and I. F. Flora, Basket-Maker III Dates from the Vicinity of Durango, Colorado. Tree-Ring Bulletin 4, No. 1: 7–8, Tucson, 1937.

Hendron, J. W., Archeological Report on the Stabilization of Reconstructed Talus House. Southwestern Monuments, pp. 478–485, National Park Service, December, 1937.

Hibben, Frank C., Excavation of the Riana Ruin and Chama Valley Survey (New Mexico). Bulletin, University of New Mexico, Anthropological Series 2, No. 1, 1937.

Holden, W. C., Excavation of Murray Cave (Texas). Texas Archeological and Paleontological Society, Bulletin 9: 48–73, 6 plates, Abilene, 1937.

Jackson, A. T., Exploration of Certain Sites in Culberson County, Texas. Texas Archeological and Paleontological Society, Bulletin 9: 146–192, 9 plates, Abilene, 1937.

Kirkland, Forrest, A Study of Indian Pictures in Texas. Texas Archeological and Paleontological Society, Bulletin 9: 89–119, 7 plates, Abilene, 1937.

Lathers, William, Jr., and Edward J. Sheehan, The Iroquois Occupation of the Mohawk Valley. The Van Epps-Hartley Bulletin 2, No. 1: 5–9, Scotia, N. Y., November, 1937.

Lemley, Harry J., and S. D. Dickinson, Archaeological Investigations on Bayou Macon in Arkansas. Texas Archeological and Paleontological Society, Bulletin 9: 11–47, 6 plates, Abilene, 1937.

Lilly, Eli, Prehistoric Antiquities of Indiana. Indiana Historical Society, 294 pp., fully illustrated, cloth bound, Indianapolis, 1937. Price $5.00 (while they last).

Mason, J. Alden, Further Remarks on the PreColumbian Relationships between the United States and Mexico. Texas Archeological and Paleontological Society, Bulletin 9: 120–129, Abilene, 1937.

Mathiassen, Therkel, The Eskimo Archeology of Greenland. Smithsonian Report for 1936 (Publication 3436), pp. 397–404, 3 plates, Washington, 1937.

McGregor, J. C., Winona Village (Arizona). Museum of Northern Arizona, Bulletin 12, 54 pp., 32 figs., Flagstaff, 1937. Price 75 cents.

McGregor, J. C., How Some Important Northern Arizona Pottery Types Were Dated. Museum of Northern Arizona, Bulletin 13, 20 pp., 14 figs., Flagstaff, 1938. Price 50 cents.

Mera, H. P., Chupadero Black-on-White. Laboratory of Anthropology, Archaeological Survey, Technical Series Bulletin 1: 1–4, 7 photographic prints, Santa Fe, 1931.

Mera, H. P., and W. S. Stallings, Jr., Lincoln Black-on-Red. Laboratory of Anthropology, Archaeological Survey, Technical Series Bulletin 2: 1–2, 4 plates, Santa Fe, 1931.

Mera, H. P., Wares Ancestral to Tewa Polychrome. Laboratory of Anthropology, Archaeological Survey, Technical Series Bulletin 2: 1–12, 3 plates, Santa Fe, 1932.

Mera, H. P., A Proposed Revision of the Rio Grande Glaze Paint Sequence. Laboratory of Anthropology, Archaeological Survey, Technical Series Bulletin 5: 1–12, Santa Fe, 1933.

Mera, H. P., A Survey of the Biscuit Ware Area in Northern New Mexico. Laboratory of Anthropology, Archaeological Survey, Technical Series Bulletin 6: 1–22, 3 maps, 1 chart, Santa Fe, 1934.

Mera, H. P., Observations on the Archaeology of the Petrified Forest National Monument. Laboratory of Anthropology, Archaeological Survey, Technical Series Bulletin 7: 1–24, Santa Fe, 1934.

Pennsylvania Historical Commission, Archaeological Survey, 1931–1934 (Pennsylvania). Sixth Report, Pennsylvania Historical Commission, pp. 31–34, Harrisburg, 1937.

Reed, Clyde T., A Carankawa Fire Implement (Texas). Texas Archeological and Paleontological Society, Bulletin 9: 218–221, 1 plate, Abilene, 1937.

Ritchie, William A., A New Archaeological Culture in New York. Museum Service 10, No. 9: 206–208, Rochester: Rochester Museum of Arts and Sciences, 1937.

Steward, Julian H., Petroglyphs of the United States. Smithsonian Report for 1936 (Publication 3474), pp. 405–425, 12 plates, 7 figs., Washington, 1937.

Toulouse, Joseph H., Jr., Excavations at San Diego Mission, New Mexico. New Mexico Anthropologist 2, No. 1: 16–18, Albuquerque: University of New Mexico, 1937.

Wheeler, S. M., A Fremont Moccasin from Nevada. The Master Key 12, No. 1: 34–35, Los Angeles: Southwest Museum, 1938.

Woods, Margaret S., Talus Unit No. 1 at Chaco (New Mexico). Southwestern Monuments, pp. 321–323, National Park Service, October, 1937.

MIDDLE AMERICA

Apenes, O., Table for Determination of Maya Calendar Round Positions. Ethnos 2 No. 4: 97–101, Stockholm: Ethnographical Museum of Sweden, 1937.

Kidder, A. V., Notes on the Ruins of San Agustin Acasaguastlan, Guatemala. Carnegie Institution, Contributions to American Archaeology 3, No. 15: 105–120, illustrated, Washington, 1937.

Linné, S., The Expedition to Mexico in 1934–35, Sent Out by the Ethnographical Museum of Sweden: De arkeologiska undersökningarna. Ethnos 2, No. 4: 267–300, Stockholm: Ethnographical Museum of Sweden, 1937.

Lothrop, Samuel K., Zacualpa, A Study of Ancient Quiche Artifacts. Carnegie Institution, Publication 472: i–vi, 1–104, 7 plates, 107 figs., Washington, 1936.

Pollock, H. E. D., The Casa Redonda at Chichen Itza, Yucatan. Carnegie Institution, Contributions to American Archaeology 3, No. 17: 129–154, 7 figs., 8 plates, Washington, 1937.

Rouse, Irving, New Evidence Pertaining to Puerto Rican Prehistory. Proceedings, National Academy of Sciences 23, pp. 182–187, 1937.

Smith, Robert E., A Study of Structure A-1 Complex at Uaxactun, Peten, Guatemala. Carnegie Institution, Contributions to American Archaeology 3, No. 19: 189–232, 11 plates, 19 figs., Washington, 1937.

Stromisvik, Gustav, Notes on Metates from Calakmul, Campeche, and from the Mercado, Chichen Itza, Yucatan. Carnegie Institution, Contributions to American Archaeology 3, No. 16: 121–128, illustrated, Washington, 1937.

Strong, William Duncan, Alfred Kidder II and A. J. Drexel Paul, Jr., Preliminary Report on the Smithsonian Institution—Harvard University Archaeological Expedition to Northwestern Honduras, 1936. Smithsonian Miscellaneous Collections 97, No. 1 (Publication 3445), 130 pp., 16 plates, 32 figs., Washington, 1938.

Thompson, J. Eric, Maya Chronology: The Correlation Question (with Appendices by Thompson, Lawrence Roys, R. C. E. Long). Carnegie Institution, Contributions to American Archaeology 3, No. 14: 51–104, Washington, 1937.

SOUTH AMERICA

Bolinder, Gustaf, Archaeological Researches on the Tableland about Bogota (Columbia). Ethnos 2, No. 4: 130–132, Stockholm: Ethnographical Museum of Sweden, 1937.

Bennett, W. C., Excavations at La Mata, Maracay, Venezuela. American Museum of Natural History, Anthropological Papers 36, Part 2: 69–138, 16 figs., New York, 1937.

Dembo, Adolfo, La Decoración Dentaria en la America Aborigen. Revista Geográfica Americana, pp. 95–100, February, 1937.

de Tuya, Angel, Las Ceremonias a la Muerte del Inca, en el Perú Precolombino. Anthropos 32, Nos. 1–2: 147–154, 1937.

EARLY MAN

Cotter, John L., The Occurrence of Flints and Extinct Animals in Pluvial Deposits near Clovis, New Mexico, Part IV: Report on Excavation at the Gravel Pit, 1936. Proceedings, Academy of Natural Sciences of Philadelphia 89: 1–16, 1937.

Jenks, Albert E., Minnesota's Browns Valley Man and Associated Burial Artifacts. American Anthropological Association, Memoirs, 49, 50 pp., 8 plates, 5 figs., 1937.

Ray, Cyrus N., More Evidence Concerning Abilene Man (Texas). Texas Archeological and Paleontological Society, Bulletin 9: 193–217, 7 plates, Abilene, 1937.

Renaud, E. B., Folsom and Yuma Points. Texas Archeological and Paleontological Society, Bulletin 9: 74–88, 1 plate, Abilene, 1937.

Witte, A. H., Buried Middens in the Floodplain of the Little Wichita River (Texas). Texas Archeological and Paleontological Society, Bulletin 9: 222–226, 1 plate, Abilene, 1937.

GENERAL

Carnegie Institution of Washington, Annual Report of the Division of Historical Research (Reprinted from Year Book No. 36, for the year 1936–1937). 30 pp., Washington, December, 1937.

INDEX TO VOLUME III

Aboriginal Potsherds from Red River, Mantiboa, 143.
Alabama (state), central, urn-burials in, 228.
Alaska: 141–2; 153; news of, 188.
Algonkin: 85; 150; 164; 173; 265; 333–4.
Alibamo: 233–4.
Amateur Contributions (ed.), 299.
Analysis of Iroquoian Ceramic Types, 333.
Anasazi, general treatment of, 5; compared with Hohokam, 19.
Andaste, 337.
Anonymous Reviews, 182.
Antiquities of the New England Indians, 265.
Antiquity of the Bow, 358.
Antiquity: in America, 172; in India, 176; in the Pacific, 176; of Mammoth Cave man, 347.
Apache, 27.
Arawak: 306; 312–14.
Archaeological: deposits in Manitoba, 143; investigations in California, 186; materials, technical contributions to the study of, 268; research in Mississippi Valley, 138; work in South America, 1934–36, supplement to, 256.
Archaeology: of Middle America, 206, 300; at Ohio State University, 279; of the Southern Black Hills, 79; in the Southwest, 3.
Architecture: of Awatovi, 125, 129; Chaco Canyon, 247; Largo-Navajo project, 242; Maya, 308.
Arctic Area, news of, 188.
Argentine, 256.
Arizona: 3; 15; 19; 172–3; 210–11; Awatovi, 122; Cliff-Dweller and Hopi cotton, 224; news of, 190.
Arkansas: 214; 305; 356.
Asiatic origin of the Woodland Culture Pattern, an hypothesis for the, 138.
Assiniboine, 150.
Athapascan, 236–7.
Australopithecus, 177.
Awatovi, the first two seasons at, 122.
Aztec: 167; 206; 213; 215–18; 220; 310; spear throwers, 52.

Bahama: 312; 314.
Bailey, J. H., An Analysis of Iroquoian Ceramic Types, 333.
Baked-Clay Objects of the Lower Sacramento Valley, California, 34.
Baker, W. E. and A. V. Kidder, A Spear Thrower from Oklahoma, 51.
Ball courts, Hohokam, 17.
Basket Maker: 5; 51–2; 123; 127; 214; 218; 345–6; 353; 358–9; houses and pottery, Chaco Canyon, 254.
Basketry: lower Sacramento Valley, California, 40.
Bell, E. H., Credit Due, 80.
Bennett, W. C.: review, La Civilizacion Chaco-Santiaguena y sus Correlaciones con las del Viejo y Nuevo Mundo, Tomo Primero, 91; Supplement to Archaeological Work in South America, 1934–36, 256.
Beothuk, 164.
Bibliography: chronology and classification, 264; Early Man in America, 102, 297, 378; general, 102, 202, 297, 378; Middle America, 101, 201, 220, 296, 315, 377; North American pottery, 155; South America, 102, 201, 257, 296, 378; Southwest, 32, 75, 254; upper North America, 100, 199, 295, 376; various, relating to clay objects in California, 47.
Boekelman, H. J. and H. G. Richards, Shells from Maya Excavations in British Honduras, 166.
Bow, antiquity of the, 358.
Brannon, P. A., Urn-Burial in Central Alabama, 228.
Brazil, 257.
Brew, J. O., The First Two Seasons at Awatovi, 122.
British Columbia, 360.
Browne, J., Antiquity of the Bow, 358.
Buker, L. W., Archaeology of the Southern Black Hills, 79.
Byers, D. S., On Standards of Texture in Pottery, 76.

Cache of Chert Blades in Saginaw County, Michigan, 186.
Caddo: 150; 214–5; 304.
California: 28; 173; 359; baked-clay objects of the Sacramento Valley, 34; Lower, 208; news of, 82, 188–9; research in, 184.
Canada: British Columbia, 360; Mackenzie Valley, 141; Manitoba, 142–3; Ontario, 85, 150, 163–5, 333, 335, 338; skeletal remains in Saskatchewan, 244.
Carib: 313; -Arawak, 306, 311.
Catawba: 86; 146.
Central America, cultures of, 310.
Ceramic: studies, 77; types, analysis of Iroquoian, 333.
Chaco Canyon: field season, 2; masonry, 247; tree rings, valley floor deposition, and erosion in, 68.

Chaouacha, 356.
Cherokee, 86.
Chiapanecan, 310.
Chibcha, 311.
Chichimec, 217–8.
Chile: 257; news of, 86.
Chitimacha, 356.
Choctaw, 234.
Chorotegan: 207; 311.
Chronological Method Applicable to the Southeast, 260.
Chronology, at Awatovi, 123.
Classification: at Awatovi, 127, 130; of culture complexes in New England, 161; Mississippi culture, 138; Pecos, 11; Roberts, 11; Southeastern pottery, 262; Southwestern, 15; Woodland, 138.
Cliff-Dweller and Hopi cotton, 224.
Coahuiltec, 214.
COE, J. L., review, The Ricketts Site in Montgomery County, Kentucky, 196.
Colombia: 305; 311–2; 314; excavations in, 256.
Colorado: 3; 26; 141; 173; 358; news of, 190.
Comparison of Fiber Properties of Arizona Cliff-Dweller and Hopi Cotton, 224.
Connecticut: 161; 265; 335.
CONRAD, C. M. and E. W. HAURY, The Comparison of Fiber Properties of Arizona Cliff-Dweller and Hopi Cotton, 224.
Copenhagen, Denmark, and the International Congress of the Sciences of Anthropology and Ethnology, 271.
Costa Rica, 209–11.
Cotton, Cliff-Dweller and Hopi, 224.
Cuba: 312; Ciboney culture of, 313–4.
Crania from Wyoming Resembling "Minnesota Man," 318.
Credit Due, 80.
Cree, 150.
Creek, 233-4.
CRESSMAN, L. S., The Wikiup Damsite No. 1 Knives, 53.
Culture origin, a symposium on certain problems in, 138.

Dakota, 150.
DARRAH, W. C., Technical Contributions to the Study of Archaeological Materials, 268.
Dendrochronology: Awatovi, 127; Canyon Creek ruin, Arizona, 225; Chaco Canyon, 68, 248; Largo-Navajo project, 242; Southwest, 13; Tree-Ring Bulletin, 367.
Dentition and human origin, 176.
Diffusion, independent invention versus, 156.

Early Man in America: Clovis exhibit, 170; Folsom problem, 173; geological evidence, 173; International Symposium on, 170; Minnesota Man, 174; in Oregon, 53, 139; paleontological evidence, 174; physical remains of, 177; in Saskatchewan, 246; in Southwest, 173; in Vero, Florida, 174; Wyoming, 318.
Ecuador, 256.
EDMUNDS, F. H., J. L. JACKSON, J. W. T. SPINKS and V. A. VIGFUSSON, Some Skeletal Remains in Saskatchewan, 244.
Erie, 338.
Eskimo: 139; 142; 324; 326; 361; Bering Sea culture, 177; Cape Dorset culture, 164.
Ethnobotany, at Awatovi, 136.

Family Tree of Chaco Canyon Masonry, 247.
FEWKES, V. J., Aboriginal Potsherds from Red River, Manitoba, 143.
First Two Seasons at Awatovi, 122.
FISCHEL, H. E., review, Archaeology of South America, 92.
Florida: 174; 312–4; 356; Hopewellian traits in, 327.
Folsom: 173; 214; complex, 26; people, 25; point, 359.
For Identification (pottery from Cahokia, Illinois), 354.
FORD, J. A.: review, Ceramic Relationships of Pre-Caddo Pottery from the Crenshaw Site, 195; A Chronological Method Applicable to the Southeast, 260.

Georgia: 163; news of, 362.
GLADWIN, H. S., Independent Invention versus Diffusion, 156.
GREENMAN, E. F., Hopewellian Traits in Florida, 327.
GRIFFIN, J. B., review, Archaeological Studies of the Susquehannock Indians in Pennsylvania, 96.
Guatemala: 169; 215–6; 300; 310–2; news of, 281, 283–4, 366.
Guiana, 306.

Haiti, cultures of, 313–4.
HAURY, E. W.: Legged Vessels from the Southwest, 264; review, Lowry Ruin in Southwestern Colorado, 288; and C. M. Conrad, A Comparison of Fiber Properties of Arizona Cliff-Dweller and Hopi Cotton, 224.
HAWLEY, F., The Family Tree of Chaco Canyon Masonry, 247.
HEIZER, R., Baked-Clay Objects of the Lower Sacramento Valley, 34.

Hidatsa, 139.
Historic use of the Spear-Thrower in Southeastern North America, 356.
HODGE, F. W., Pot-Hunting: A Statement of Policy, 184.
Hohokam: 211; 212; 264; general treatment of, 15; compared with Anasazi, 19.
Hokan: 173; -Siouan linguistic group, 214.
Honduras: 309–11; news of, 283–4; British, shells from Maya excavations in, 166.
Hopewell, 86.
Hopewellian: Elemental Aspect, 139; in Kansas, 82, 276; in New England, 163.
Hopewellian Traits in Florida, 327.
Hopi: 123–4; 133; and Cliff-Dweller cotton, 224.
HOWELLS, W. W., Crania from Wyoming Resembling "Minnesota Man," 318.
Huaxtec: 207; 215; 217; 305; 311.
Human Remains from Mammoth Cave, Kentucky, 339.
Hypothesis for the Asiatic Origin of the Woodland Culture Pattern, 138.

Idaho, 141.
Illinois (state): 140–1; 150; 327; 331; 353; news of, 192; pottery from Cahokia, 354; rock carvings, 179.
Illinois, 150.
Independent Invention versus Diffusion, 156.
Indiana, news of, 192.
Indians versus Pot-Hunters, 267.
International Congress of the Sciences of Anthropology and Ethnology, Copenhagen, 271.
International Symposium on Early Man, 170.
Invention versus diffusion, independent, 156.
Iowa (state): 140–1; news of, 192.
Iroquois: 85; ceramic types, analysis of, 333.

JACKSON, J. L., F. H. EDMUNDS, J. W. T. SPINKS and V. A. VIGFUSSON, Some Skeletal Remains in Saskatchewan, 244.
Jicaque, 311.
JOHNSON, F., Problems Surrounding the Classification of Certain Culture Complexes in New England, 161.
JUDD, N. M., review, History of Hawikuh, New Mexico . . . , 286.

Kansa: 82; 276.
Kansas, news of: 82; 275.
Karankawa, 214.
Kentucky, human remains from Mammoth Cave, 339; news of, 192.
KEYES, C. R., review, Excavations at the Laury Indian Village and Burial Site, . . . Nebraska, 290.
KIDDER, A. V.: editorial, Looking to the Future, 119; and W. E. Baker, A Spear Thrower from Oklahoma, 51.

Lacandon, 306.
Largo cultural phase, northern New Mexico, some aspects of the, 236.
Legged Vessels from the Southwest, 264.
Lithic Laboratory for the United States, 84.
Louisiana, news of, 363.

Maglemosean culture, 175.
Maine: 162–3; news of, 85, 279.
Mammoth Cave, Kentucky, human remains from, 339.
Mandan: 139; 150.
MASON, J. A., Observations on the Present Status and Problems of Middle American Archaeology: Part 1, 206, Part 2, 300.
Masonry, Chaco Canyon, 247.
Massachusetts: 161; 163; 265; news of, 362–3.
Maya: 206–7; 214–5; 218; 220; 281; 283–4; 300–10; agriculture, 304; architecture, 308; ball game, 306; culture origin, 302; dates, 301; excavations in British Honduras, shells from, 166; glyphs, 300; houses, 307; language, 305; settling of Yucatan, 308; sub-areas, 309.
MCGREGOR, J. C., Ceramic Studies, 77.
MCKERN, W. C.: An Hypothesis for the Asiatic Origin of the Woodland Culture Pattern, 138; editorials, New Officers, 1; Chaco Canyon Field Session, 2; Professional and Amateur Interests, 203; Undesirable Proficiency, 205; Amateur Contributions, 299; News Items, 299; review, Rediscovering Illinois, 368.
MENZIES, T. P. O., Northwest Coast Middens, 359.
MERA, H. P., Some Aspects of the Largo Cultural Phase, Northern New Mexico, 236.
MERWIN, B. W., Rock Carvings in Southern Illinois, 179.
Methods: chronological, for the Southeast, 260; for decomposing breccia, 269; pottery construction, 78; for studying economic plants in sun-dried bricks, 268.
Mexico: 3; 17; 52; 168; 206; 345; 301–5; 310–1; Chihuahua, 23, news of, 283; 363; 366; Indians of, 324; northern, 207; Yucatan, 166, 283, 300, 306, 308–9, 312.
Michigan: 141; 327; chert blades from, 186.

Middle America, news of: 281; 363.
Middle American Archaeology, observations on the present status and problems of, Part 1, 206; Part 2, 300.
Mimbres: 23; 211.
Minnesota: 139–42; 151; 172; 174; news of, 278.
Minnesota Man, crania from Wyoming resembling, 318.
Mississippi Pattern: 138; Fort Ancient culture, 338; Iroquoian Aspect, 163; Middle Phase, 352; Plains Phase, 139; Upper Phase, 138, 277.
Missouri (state), news of, 192.
Miwok, Plains, 43.
Mixtec, 220.
Mogollon, general definition, 21.
Mohawk, 337.
Mono, Western, 41.
Montana: 141; 358; news of, 190, 278.
Munsee, 86.

Nahua: 207; 216; 219; 310.
Navajo: 27; 123; 236.
Neanderthaloid crania from Java, 171.
Nebraska: 139–41; 174; 358; news of, 191, 275–6.
NEUMANN, G. K., The Human Remains from Mammoth Cave, Kentucky, 339.
Nevada: 3; 5; 26; news of, 189.
Nevome, 212.
New England: classification of cultures in 161; Indians, antiquities of the, 265; Iroquois pottery of, 333; pottery, 76.
Newfoundland, 164.
New Jersey, news of, 280.
New Mexico: 3; 14; 21; 26; 171; 173; 210; Chaco Canyon field Season, 2; Largo cultural phase, 236; news of, 274; tree rings, valley floor deposition and erosion in Chaco Canyon, 68.
New York: 26; 140; 151; 161; 163; Iroquoian pottery, 333–8; news of, 85, 279–81, 362.
Nicaragua: 209; 310–1.
Nomadic and semi-nomadic groups, Southwestern, 25.
North Dakota: the Dakotas, 150.
Northeast, Iroquois pottery in, 333.
Northeastern Area, news of: 84; 279; 362.
Northern Mississippi Area, news of: 84; 192; 278.
Northwest Coast: Indians, 322, 324; middens, 359.

Observations on the Present Status and Problems of Middle American Archaeology: Part 1, 206; Part 2, 300.
Ohio: 26; Hopewell culture, 327–31, 334; news of, 192.
Ojibwe, 150.
Oklahoma: 3; 356; news of, 193; spear-thrower from, 51; State Archaeological Society, 83.
Onondaga, 337.
Ontario: 163–4; Iroquois pottery of, 333, 335, 338; news of, 85.
Oregon: news of, 82, 272; stone knives from eastern, 61; Wikiup Damsite Knives, 53.
Origin of American culture, 177.
Oto, 275.
Otomi, 217.
Ouacha, 356.
Ozark Bluff Dwellers, 52.

Pacific Coast Area, news of: 82; 188; 272.
Paintings, wall at Awatovi, 135.
Paiute, 27.
Paleolithic tools, evolution of, 178.
Palestine, excavations on Mount Carmel, 171.
Panama: 310–2.
Papago: 18; 212.
PARKER, A. C., Indians versus Pot-Hunters, 267.
Pawnee: 145; 214; 275–6.
Pecos Classification, 11.
Peking Man, 174.
Pennsylvania: Iroquois pottery of, 333–8; news of, 86.
Pericu, 209.
Peru: 304; 312; 356; news of, 87; research in, 256.
Physical type: with Anasazi, 6; Mammoth Cave, Kentucky, 339; Saskatchewan, 244; Wyoming, 318.
Pictographs, South Dakota, 79.
Pima: 18; 212.
Pipil, 215.
Pithecanthropus, 171.
Plains, Early Man in, 318.
Plains Area, news of: 82; 190; 275.
Pleistocene man in America, 172.
Pollen analysis in American archaeology, 172.
Pomo, 41.
Ponca, 276.
Pot-Hunting: A Statement of Policy, 184.
Potsherds from Red River, Manitoba, aboriginal, 143.
Pottery: Alabama, 228; American, origin of, 139; Awatovi, 126, 129; Basket-Maker and Pueblo, 13; Cahokia, 354; ceramic studies, 77; Chaco Canyon, 69; chronology, Southeastern, 260; construction, 145; decoration, 146; Eurasian and North American, relationship of, 152; Hidatsa, 139; Hohokam 18; Hopewellian, in Florida, 329; Iroquoian,

333; maize-pottery complex, 141; Mandan, 139; Mexican, 212–3, 215–6, 219; Mogollon, 22; New England, 76; objects, Sacramento Valley, California, 34; Pueblo, 247; Pueblo and Mexican, 211; South Dakota, 80; Southwest, 264; in Southwest, Woodland-like, 236; standards for texture in, 76; surfacing, 146; Texas, 215; Woodland, 150; Woodland, distribution of, 141; Woodland and Mississippi, 139.
Problems Surrounding the Classification of Certain Culture Complexes in New England, 161.
Pueblo: 5; 124; 127; 131; 137; 167; 207; 216; 219; 225; 353; 359; masonry, 247; pottery, 236, 247.
Puerto Rico: 313; Crab culture of, 314.

Q Complex, 214–5.

Reconnaissance, A, 184.
Red Paint culture, 162.
Reviews: Antiquities of the New England Indians, 89; Archaeology of Santa Marta, Colombia, the Tairona Culture, Part II, Section I, Objects of Stone, Shell, Bone and Metal, 293; Archaeology of South America, 92; Archaeological Studies of the Susquehannock Indians of Pennsylvania, 96; La Civilizacion Chaco-Santiaguena y sus Correlaciones con las del Viejo y Nuevo Mundo, Tomo Primero, 92; Evidence of Recent Movements along Faults of Balcones System in Central Texas, 285; Excavations at Leary Indian Village and Burial Site, . . . Nebraska, 290; History of Hawikuli, New Mexico . . . , 286; Indian Rock Writing in Idaho, 375; Lowry Ruin in Southwestern Colorado, 288; Petroglyphs of Oregon, 374; Rediscovering Illinois, . . . 368.
RICHARDS, H. G. and H. J. BOEKELMAN, Shells from Maya Excavations in British Honduras, 166.
RITCHIE, W. A.: editorial, Greetings, 1; review, Antiquities of the New England Indians, 89.
ROBERTS, G. H. H., JR., Archaeology in the Southwest, 3.
Rock Carvings in Southern Illinois, 179.
ROGERS, D. B., A Reconnaissance, 184.

Saskatchewan, some skeletal remains in, 244.
Seneca: 85; 335; resolution, 267.
SENTER, D., Tree Rings, Valley Floor Deposition, and Erosion in Chaco Canyon, New Mexico, 68.
Shells, as time indicators, 166; 172.
Shells from Maya Excavations in British Honduras, 166.
SHEPARD, A. O., Anonymous Reviews, 182.
Shoshonean, 27.
Sioux: 86; 150; 278; physical type, 320–5.
SMITH, G. H., A Prehistoric Habitation Site on the St. Croix River, 198.
Society for American Archaeology: membership, 103.
Some Aspects of the Largo Cultural Phase, Northern New Mexico, 236.
Some Skeletal Remains in Saskatchewan, 244.
South America: 306; 310–12; 314; 1934–36, supplement to archaeological work in, 256.
South American Area, news of: 86; 194.
South Dakota: Black Hills, 79; the Dakotas, 150.
Southeast: 311–4; Hopewellian pottery in, 327; spearthrower in historic, 356.
Southeast, a chronological method applicable to the, 260.
Southeastern Area, news of: 193; 273; 362.
Southwest: 353; archaeology in the, 3; Awatovi excavations, 122; California pottery derived from, 43; ceramic studies, 77; Chaco Canyon, 68, 247; *Homo novusmundus*, 326; Largo phase, 236; legged vessels from, 264; northern Mexico, 207; Pecos skulls, 324–5; pottery compared to New England, 76.
Southwestern Area, news of, 190.
Spear-thrower: from Oklahoma, 51; in southeastern North America, historic use of, 356.
SPECK, F. G., Antiquities of the New England Indians, 265.
SPINES, J. W. T., F. H. EDMUNDS, J. L. JACKSON and V. A. VIGFUSSON, Some Skeletal Remains in Saskatchewan, 244.
Standards for texture in pottery, on, 76.
STEWARD, J. H.: review, Petroglyphs of Oregon, 374; review, Indian Rock Writing in Idaho, 375.
Stratigraphic Study of southeastern sites, 263.
STROEBEL, R. W., A Cache of Chert Blades in Saginaw County, Michigan, 187.
STRONG, W. D., The International Symposium on Early Man, 170.
Supplement to Archaeological Work in South America, 1934–36, 256.
Susquehannock, 337.
SUTTON, H., Seneca resolution signed by, 267.
SWANTON, J. R., Historic Use of the Spear-

Thrower in Southeastern North America 356.
Symposium on Certain Problems in Culture Origin, 138.

Taino: 306–313.
Tarahumara, 210.
Tarascan: 207; 213; 216–7; 219.
Technical Contributions to the Study of Archaeological Materials, 268.
Tennessee: 26; news of, 192–3, 362.
Tepecano, 212.
Tepehuan, 212.
Terminology, pottery, 76.
Texas: 3; 23; 27; 167; 173; 214–5; spear throwers, 52.
THOMPSON, J. E., review, Archaeology of Santa Marta, Colombia, the Tairona Culture, Part II, Section I, Objects of Stone, Shell, Bone and Metal, 293.
TITTERINGTON, P. F., For Identification, 354.
Toltec: 210; 213; 216–8; 220; 307; 310.
Tonkawa, 214.
Totonac: 207; 215; 305; 311.
Tree-ring dating (see dendrochronology).
Tree Rings, Valley Floor Deposition, and Erosion in Chaco Canyon, New Mexico, 68.

Ulvan, 311.
Urn-Burial in Central Alabama, 228.
Utah: 3; 5; news of, 273.
Uto-Aztecan linguistic stock, 207.

VAN ROYEN, W., review, Evidence of Recent Movements along Faults of Balcones System in Central Texas, 285.
Venezuela: 304–6; 313–4.
Vermont: 161; 163; news of, 279, 362.
VIGFUSSON, V A., F. H. EDMUNDS, J. L. JACKSON and J. W. T. SPINKS, Some Skeletal Remains in Saskatchewan, 244.
Virgin Islands, 314.
Virginia, 26.

West Indies, cultures of, 312.
Wikiup Damsite No. 1 Knives, 53.
Wintun, Trinity River, 42.
Wisconsin: 140–2; 151; 327; 329; 331; news of, 192.
Woodland Area, 265.
Woodland culture pattern, an hypothesis for the Asiatic origin of the, 138.
Woodland Pattern: 160; 345; 352; in Kansas, 275; in Nebraska, 277; in New England, 163; pottery, 150; Woodland-like pottery in Southwest, 236.
World Congress of Documentation, 87.
Wyoming: 141; crania from, resembling "Minnesota Man," 318.

Xincan, 311.

Yokuts, Chulamni, 43.

Zapotec: 207; 220.
Zoquan, 310.
Zuni, 123.

E
51
.495

American Antiquity

A Quarterly Review of American Archaeology

Contents

EDITORIALS 299

Observations on the Present Status and Problems of Middle American Archaeology, Part II. J. ALDEN MASON 300

Crania from Wyoming Resembling "Minnesota Man." W. W. HOWELLS 318

Hopewellian Traits in Florida. E. F. GREENMAN 327

An Analysis of Iroquoian Ceramic Types. JOHN H. BAILEY . . 333

The Human Remains from Mammoth Cave, Kentucky. GEORG K. NEUMANN 339

CORRESPONDENCE . . . . . *See Cover III*

NOTES AND NEWS 362

BOOK REVIEWS. . . . . *See Cover III*

SOME RECENT PUBLICATIONS 376

INDEX 379

Published by the

Society for American Archaeology

Vol. III *April, 1938* No. 4

SOCIETY FOR AMERICAN ARCHAEOLOGY

OFFICERS

President: A. V. KIDDER, Division of Historical Research, Carnegie Institution of Washington, 10 Frisbie Place, Cambridge, Massachusetts.

Vice-President: WM. A. RITCHIE, Rochester Museum of Arts and Sciences, Rochester, New York.

Secretary-Treasurer: CARL E. GUTHE, University of Michigan, Ann Arbor, Michigan.

Editor: W. C. MCKERN, Public Museum, Milwaukee, Wisconsin.

Assistant Editors:

HENRY B. COLLINS, JR., Arctic Geographical Area.
E. W. GIFFORD, Pacific Coast Geographical Area.
EMIL W. HAURY, Southwestern Geographical Area.
WALDO R. WEDEL, Plains Geographical Area.
THORNE DEUEL, Northern Mississippi Geographical Area.
W. A. RITCHIE, Northeastern Geographical Area.
WM. S. WEBB, Southeastern Geographical Area.
J. ALDEN MASON, Middle American Geographical Area.
WENDELL C. BENNETT, South American Geographical Area.
JAMES B. GRIFFIN, Field and Laboratory Technique.
F. H. H. ROBERTS, JR., Early Man in America.

Members of Council: The President, Vice-President, Secretary-Treasurer, Editor, and E. F. GREENMAN, M. R. HARRINGTON, EMIL W. HAURY, PAUL S. MARTIN, ARTHUR C. PARKER, FRANK M. SETZLER, W. D. STRONG, and WM. S. WEBB.

AMERICAN ANTIQUITY is published at 450–454 Ahnaip Street, Menasha, Wisconsin, quarterly in the months of January, April, July and October by the Society for American Archaeology. Subscription only by affiliation in the Society for American Archaeology (annual dues $3.00); includes the quarterly issues of AMERICAN ANTIQUITY and other releases as issued.

Entered as second-class matter July 22, 1935, at the post office at Menasha, Wisconsin, under the Act of March 3, 1879.

Contributions and publications for review may be sent to the Society at 450–454 Ahnaip Street, Menasha, Wisconsin or to the editor, W. C. McKern. Public Museum, Milwaukee, Wisconsin.

CORRESPONDENCE

For Identification. P. F. TITTERINGTON 354

Historic Use of the Spear-Thrower in Southeastern North America. JOHN R. SWANTON 356

Antiquity of the Bow. JIM BROWNE 358

Northwest Coast Middens. T. P. O. MENZIES 359

BOOK REVIEWS

COLE and DEUEL. *Rediscovering Illinois: Archaeological Explorations in and around Fulton County.* (*McKern*) 368

CRESSMAN. *Petroglyphs of Oregon.* (*Steward*) 374

ERWIN. *Indian Rock Writing in Idaho.* (*Steward*) 375